ANNUAL REPORT

ON THE

HEALTH OF BLACKPOOL

FOR 1899.

BY

A. JASPER ANDERSON, M.A., M.B., Oxon., D.P.H. Cantab.

Medical Officer of Health.

Blackpool:

PRINTED AT THE "HERALD" OFFICE, BIRLEY STREET.

1900.

To the Mayor, Aldermen and Burgesses of the Borough of Blackpool.

Mr. Mayor and Gentlemen,

I have the honour to present to you my Ninth Annual Report on the Health of Blackpool, containing an account of the work of the Sanitary Department during the year 1899.

You will notice that although the growth of the town has not been so rapid as in 1898 the population estimated on the usual method of computation has increased by 2,786 persons. The general death-rate was 14·77, being below the averages for the three quinquennia 1881-5, 1886-90, and 1891-95.

I have to thank the Chairman and Members of the Sanitary Committee for the advice and assistance they have given me during the past year. They have shewn themselves to be actuated with a desire to make the town as sanitary as possible, and the administration as smooth and perfect as may be. Their great interest has given me a great deal extra work, but I am willing to respond to their call as far as lies in my power. If the present rate of progress continues great benefits to the public should result.

I have been very much struck with the fact that very few complaints are received, only 87 in the year, and to find from personal observation that many householders allow most serious sanitary

defects to exist—such as blocked drains, blocked w.c.'s, and the like—for a lengthened period. Neither the Sanitary Inspectors nor myself can be ubiquitous, but any complaint received will be dealt with at once and without divulging the name of the informant. We are at all times willing to investigate any complaint, and I in fact invite them, and if found justifiable am prepared to have them remedied at once.

I commend the body of the Report to your careful perusal and study, and trust that the statistics, etc., will prove useful to you in your efforts for the welfare of the town, and in the discussions which these efforts give rise to.

I am, Mr. Mayor and Gentlemen,

Your obedient Servant,

A. JASPER ANDERSON,

Medical Officer of Health.

Public Health Office, Blackpool,
February, 1900.

REPORT.

1.—VITAL STATISTICS.

A.—Summary.

Area of Borough (exclusive of foreshore)		3,495 acres
Population (Census April 6th, 1891)		23,846 persons
Persons per House as per Census		4·84
	1898.	1899.
Rateable Value (General District Rate)	£307,370	£378,660
Do. (Borough Rate)	£315,776	£370,368
No. of Dwelling-Houses on Rate Book.....	9,673	10,203
Do. do. do. empty...	317	278
Population of Residents estimated at middle of year from No. of inhabited houses.....	45,414	48,200
Density of Population (persons per acre).....	12·99	13·7
Birth-rate (per 1,000 inhabitants)	27·74	27·34
Death-rate (gross) Do.	16·99	17·88
Infant Mortality (per 1,000 births)	177·7	184·37
Zymotic-rate (per 1,000 inhabitants)	2·99	2·75
Death-rate (corrected for Visitors)	13·85	14·77
Do. (corrected for age and sex distribution; factor 1·129)	15·63	16·67
Infant Mortality (corrected for Visitors)	163·5	172·98
Zymotic-rate (corrected for Visitors)	2·49	2·34

B.—Population.

The population has been estimated, as in former years, by multiplying the number of inhabited houses in each of the six wards of the town by the average number of persons per house for each ward, as given by the last census. This gives the population for each ward, and their sum is the population of the town.

The accuracy with which this estimate is made controls that of all the rates deduced therefrom. The difficulties of making a correct estimate increase with the number of years that have elapsed since the last census year. But so long as the estimates are made each year on the same basis, and there is no alteration in the character of the population, the various birth and death rates of the town for the different years will be comparable *inter se*, extreme caution being taken, however, before making comparisons with the corresponding rates of other districts.

There were in August, 1899, 9925 inhabited houses, and a resident population (excluding visitors staying in the town) of 48,200. All rates in this report, unless otherwise stated, are calculated upon this estimated population. There were 530 more houses on the rate-book in 1899 than in 1898. The population for 1899 would have been 36,502 had the rate of increase of the town since 1891 been equal to the rate between 1881 and 1891.

The increase of population over the previous year has been 2786, made up of 606, (the *natural increase*, excess of births over deaths), and 2180, the excess of immigrants into, over emigrants from, the Borough.

The greatest increase (943) has taken place in Foxhall Ward, and the next (532) in Claremont Ward.

C.—Births.

During the year, 1,307 births occurred in the Borough, but to these must be added as belonging thereto 11 births in the Kirkham Workhouse, *i.e.*, 1,318 births, (687 males and 631 females). The birth-rate was 27·34 as compared with 27·74 last year, and 23·91 for the quinquennium 1891-95. For England and Wales the rate during 1899 was 29·3, and for the 33 Great Towns 30·2. The births include 78 illegitimate children, viz., 37 boys and 41 girls. The percentage of illegitimate births of total births was 5·91, and the rate of illegitimate births was 1·618 per 1,000 inhabitants. Amongst 1,000 females between the ages 20 and 45 years, their were 118·75 births, and 7·03 illegitimate births.

D.—Deaths.

The deaths registered during the year were 862 ; and of these 150 occurred amongst persons staying temporarily in the town, and belonging to a population not included in the estimate of 48,200 persons. There were, therefore, 712 deaths amongst residents during the year—including 20 deaths in Kirkham Workhouse, which is out of the Borough, 1 in the Manchester Royal Infirmary, and 1 in St. Mary's Hospital, Manchester. The gross death-rate was 17·88, and the rate amongst residents was 14·77. The death-rate corrected for age-and-sex distribution, to render it comparable with the Registrar General's rates for other districts was 16·67.

The death-rate for England and Wales during 1899 was 18·33, and for the 33 great towns 20·2. The death-rate for the 67 other large towns was 18·0.

In Table A in the Appendix it will be seen that spaces are left for deaths occurring within the district and not belonging thereto, and also for deaths occurring outside the district but belonging thereto, and also spaces for classifying the same under certain age-groups and certain diseases. The deaths occurring within a district and not belonging to it are usually carefully inserted and allowed for in calculating the death-rate of the district ; but the deaths amongst residents of the district occurring outside are not, because at present there are no means of gaining full knowledge of such deaths. Thus, for example, the 150 deaths excluded by me as those of visitors will not be included in the death-rates of the districts from whence they came to Blackpool. There is a distinct necessity for some clearing-house arrangement for dealing with such deaths and for informing the Medical Officer of Health of the district to which the deceased person belonged of the fact and date of the death, the cause of death and other particulars.

The population and the rates of the six wards of the town are given in the following table, the population of each ward being calculated on the number of the inhabited houses. The average of the rates for the five years 1891-5 are given for comparison.

TABLE I.

Ward.	Population 1899.	Birth Rate.			Death Rate.			Zymotic Rate.		
		1898	1891-5	1899	1898	1891-5	1899	1898	1891-5	1899
Claremont	8,104	22·85	24·06	23·32	12·28	14·05	10·98	2·11	2·07	1·23
Talbot	10,996	35·24	29·09	31·53	16·24	17·37	18·32	3·89	2·18	3·28
Bank Hey	2,126	17·32	11·87	11·28	13·11	12·84	12·22	0·46	1·29	1·41
Brunswick	6,744	25·41	21·32	25·81	16·21	14·54	16·01	2·81	1·15	1·92
Foxhall....	13,432	30·27	25·65	28·44	12·97	14·84	14·74	1·92	1·98	2·53
Waterloo..	6,798	21·19	20·76	29·42	11·15	15·19	13·23	2·86	1·75	2·50

The deaths in Kirkham Workhouse are allocated to the wards from whence the patients were removed.

The order of the birth rates is Talbot, Waterloo, Foxhall, Brunswick, Claremont and Bank Hey, varying from 31·53 in Talbot to 11·28 in Bank Hey Ward.

The death-rates from all causes are the highest in Talbot Ward and the lowest in Claremont Ward. For zymotic diseases the death-rate is the highest in Talbot and the lowest in Claremont Ward.

Deaths in Certain Age Groups.

The death-rates per 1,000 *persons living within six definite age-groups* have been calculated, as also the rates for a thousand of each sex living within these limits, and are given in Table C in the Appendix.

Of a thousand children under five years old 60 died, as compared with 57 in 1898 and 62 in 1897. Males died in the proportion of 72 to 50 females.

In the age-period over 5 and under 15 years, males died in the proportion of 1·7 to 2·35 females out of 1,000 of each sex.

From 15 years to 25 years, the death-rate for males was 3·01 and for females 4·47 per 1,000.

Over 25 and under 65 years, the death-rate for males was 13·37 and for females 9·05, as compared with 12·01 and 9·23 respectively in 1898.

The death-rates in the age-group, 65-75 years, were 64·41 for males and 44·34 for females, as compared with 49·6 and 50·62 respectively in 1898.

Over 75 years the death-rate amongst males was 150 and females 88·49, the corresponding rates in 1898 being 139·6 and 126·6. This alteration is mainly due to the small numbers entering into calculation at this advanced age.

Deaths of Visitors.

In health resorts it is necessary to deduct from the total deaths those occuring amongst persons staying in the town. Each death is inquired into, and after that inquiry a decision is come to as to whether the deceased was a visitor or not. In 1899 it was decided to exclude 150 deaths as those of visitors, viz, 73 males and 77 females. Twenty-six of these were under five years of age, and 124 above. There were 11 deaths from phthisis, 21 from respiratory diseases, 17 from heart disease, and 5 from injuries, amongst these deaths. There were 20 deaths from the seven zymotic diseases, in some of which cases either infection or invasion of the disease had taken place before arriving in the town.

Length of Residence in Blackpool of Persons who Died During the Year 1899.

As usual I have prepared Table II. to show the length of time persons who died in 1898 had lived in Blackpool, classifying the same into six age-groups.

TABLE II.

Length of Residence of Persons who died during the year 1899.

Age Group.	Deaths.	Length of Residence in Blackpool.															Born in Blackpool.
		7 days and under.	14 to 7 days.	1 month to 14 days.	3 months to 1 month.	6 months to 3 months.	9 months to 6 months.	12 months to 9 months.	2 to 1 year.	3 to 2 years.	4 to 3 years.	5 to 4 years.	15 to 5 years.	25 to 15 years	Over 25 years	Indefinite.	
Under twelve months	243	3	2	3	3	4	1	...	...	...	...	...	...	...	...	...	227
1 year and under 5	72	4	1	2	1	3	1	2	4	...	...	...	...	...	...	...	54
5 and under 15	29	2	3	...	2	3	...	...	2	...	3	...	2	...	...	...	12
15 and under 25.....	47	3	2	2	3	2	3	2	4	1	3	1	6	4	...	1	10
25 and under 65.....	315	28	10	7	20	6	5	4	23	16	7	13	62	45	14	8	47
65 and over	156	7	6	7	12	1	0	2	7	9	4	12	35	22	15	2	15
Totals	862	47	24	21	41	19	10	10	40	26	17	26	105	71	29	11	365

Infant Mortality.

There were 243 deaths of children under twelve months of age, and 1,318 births, *i.e.*, a rate of 184·37 per 1,000 births, as compared with 177·7 in 1898, 191·3 in 1897, and 158·5 in 1896.

Of the 243 deaths, 15 were of children not born in Blackpool. Leaving these out of consideration the corrected rate is 172·98, as compared with the corresponding rates for 1898 of 163·5, and 169·1 for the five years 1891-5. (See Table V. for the complete figures).

In Table F (in the Appendix) the quarterly rates are given, from which the rate is seen to be 243 in the third quarter, 206·3 in the fourth, 118·9 in the first, and 116·7 in the second.

For 1898 the corresponding rates were 235.1 in the third quarter, 196·5 in the fourth, 118·8 in the first, and 104·1 in the second.

During 1899 in England and Wales, 163 infants under 1 year old died out of 1,000 births. For the 33 great towns, the rate of infant mortality in 1899 was 181, ranging from 152 in Huddersfield, 154 in Croydon, and 158 in Bristol, to 209 in Salford, 210 in Nottingham, 255 in Preston, and 269 in Burnley.

The causes of death are classified in the adjoining table under several headings, and also according to the age at death. As in previous years 'Congenital Debility' and 'Asthenia' have been classified under premature birth, and 'Marasmus' under atrophy.

TABLE III.—Deaths, with Ages and Causes, of Children under 12 months old in 1899.

Causes of Death.	1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	1st week.	2nd week.	3rd week.	4th week.	Ages by Months. 1st mnth	2nd do.	3rd do.	4th do.	5th do.	6th do.	7th do.	8th do.	9th do.	10th do.	11th do.	12th do.	Total.
Premature Birth	13	6	3	3	...	2	1	28	4	2	3	37	2	1	1	...	...	1	...	...	...	...	...	42
Atelectasis	2	..	...	...	1	...	...	3	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	3
Congenital Malformations	...	...	...	...	...	1	1	2	...	1	...	3	1	...	...	...	...	...	...	...	...	.	...	4
Whooping Cough	...	...	...	...	...	...	...	...	...	1	...	1	...	1	2	...	1	1	1	1	2	1	2	13
Measles	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...	...	...	3
Scarlet Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Enteritis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diarrhœal Diseases	...	...	...	...	...	...	...	...	...	2	2	4	3	7	9	8	7	9	4	5	2	4	4	66
Erysipelas	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilis	...	...	...	...	...	...	...	...	...	1	...	1	...	...	1	...	1	...	...	...	...	...	...	3
Liver Diseases	...	...	...	1	...	...	...	1	1	...	...	2	...	...	...	...	...	...	...	...	...	...	1	3
Dentition	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	...	...	3
Other Diseases of Digestive Organs	..	...	...	...	...	...	...	...	...	2	...	2	1	...	1	1	...	...	...	1	...	...	...	6
Convulsions and Diseases of Nervous System	...	...	2	...	...	...	1	3	1	2	1	7	2	1	1	1	1	...	2	1	2	...	...	18
Tubercular Meningitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	2
Tabes Mesenterica	.	..	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	2
Other Tubercular Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	2
Atrophy	...	...	...	...	...	...	...	...	...	...	...	...	1	2	3	2	2	1	...	1	...	...	2	14
Diseases of Respiratory Organs	...	...	...	...	...	...	...	...	1	...	...	1	3	7	3	4	3	5	3	1	5	2	3	40
Injury at Birth	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Navel Hæmorrhage	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1
Suffocation	...	...	...	...	1	...	...	1	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	2
Other Violence	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
All other causes	1	..	..	...	...	...	...	1	...	1	...	2	2	2	3	2	...	1	...	1	1	1	1	16
All Causes	16	6	5	4	2	3	3	39	8	12	6	65	15	21	25	22	15	21	11	14	12	9	13	243

Six of these were uncertified, the causes of death being stated to be premature birth in one, and 'natural causes' in the other five. Five inquests were held, the verdicts were—(i) "natural causes"; (ii) "malnutrition and starvation, but there is not sufficient evidence to shew that the child died from criminal neglect"; (iii) "misadventure from suffocation"; (iv) "misadventure, overlaid whilst in bed with parents"; and (v) "want of attention at birth".

Of the 243 deaths, 15 of the children had neither been born in Blackpool nor Kirkham Workhouse, one being illegitimate. Of the remaining 228 children, 208 were legitimate and 20 illegitimate. During the year there were 1,240 legitimate and 78 illegitimate births, hence, out of every 1,000 legitimate births there were 167·7 deaths, and 256·4 out of 1,000 illegitimate births during the first year of life. The figures of the similar rates for the five years 1891-95, were 162·7 and 279 respectively.

In Table IV. the deaths of children under 12 months old for the years 1893 to 1899 are given, distributed into wards.

TABLE IV.

Number of Children under 1 year old who died in the respective Wards.

Ward.	1893	1894	1895	1891-5	1896	1897	1898	1899
Claremont	18	6	20	78	20	22	24	15
Talbot	42	34	55	179	40	57	58	69
Bank Hey	5	2	3	15	9	...	7	6
Brunswick	19	18	23	91	20	23	35	40
Foxhall	29	25	56	159	41	49	60	66
Waterloo	10	11	12	60	7	25	22	32
Total	123	96	169	582	137	176	206	228

Eight of the eleven births in Kirkham Workhouse have been allocated to the wards from which the mothers were taken to the workhouse. In the other three cases it has not been possible to trace the previous addresses of the mothers. We have thus 189 births in Claremont Ward, 346 in Talbot, 24 in Bank Hey, 174 in Brunswick, 382 in Foxhall, and 200 in Waterloo.

From these the rate of mortality for each ward for the year has been calculated, and is given in Table V. along with the corresponding rates for the years 1893 to 1899.

TABLE V.

INFANT MORTALITY.—Deaths of Children under 1 year old per 1,000 Births.

WARD.	1893	1894	1895	1891-5	1896	1897	1898	1899
Claremont	209·3	62·5	183·5	172·5	142·8	142·8	138·7	79·3
Talbot	212·1	134·3	201·4	162·8	135·6	184·4	156·3	199·4
Bank Hey	263·1	62·5	90·9	112	25·0	...	189·1	250·0
Brunswick	177·5	148·8	200·0	168·2	160	144·7	214·7	229·8
Foxhall	177·9	161·3	231·4	187·2	166·6	173·1	158·7	172·7
Waterloo	153·8	159·4	115·4	163·9	79·5	215·5	165·4	160·0
Rate for Borough	192·8	132	191·6	169·1	145·7	168·5	163·5	172·98

MORTALITY FROM ZYMOTIC DISEASES.

The seven principal zymotic diseases, viz. :—Small-pox, scarlet fever, diphtheria (including membranous croup), 'fever,' measles, whooping cough, and diarrhœa caused 133 deaths, as compared with 136 in 1898, and 112 in 1897. Of these 19 were visitors. The zymotic rate per 1,000 inhabitants was 2·75, and 2·34 deducting the deaths of visitors.

For England and Wales the zymotic rate was 2·21, and for the 33 great towns 2·81.

There were no deaths from small-pox, 4 from scarlet fever, 5 from diphtheria, 16 from 'fever,' 11 from measles, 16 from whooping cough, and 81 from diarrhœa.

The zymotic rate from the chief zymotics, deducting the deaths from diarrhœa and whooping cough, was 0·744, as compared with 0·726 in 1898, and 1·22 for the 33 great towns.

The diarrhœal rate was 1·68, as compared with 2·224 in 1898, and 1·21 for the 33 great towns in 1899.

Mortality from other Diseases.

Phthisis caused 66 deaths, including 11 visitors, giving a death-rate of 1·369, and deducting visitors of 1·141. For 1898 the corresponding death-rates were 1·14 and 0·99 respectively.

Diseases of the Respiratory Organs caused 152 deaths, of whom 21 were visitors. The death-rate was 3·15 as compared with 3·04 in 1898. The death-rate corrected for visitors was 2·718

The deaths from lung diseases other than phthisis, constituted 17·63 per cent of the total deaths as compared with 17·87 per cent in 1898. There were 49 deaths in the first, and 37 in the second quarter.

Influenza. Thirteen deaths were certified as primarily due to this cause, viz., 3 in the first, 6 in the second, and 4 in the fourth quarter of the year. In one death influenza was mentioned as a secondary cause.

Alcohol was certified as the primary cause of death in two males. In 14 cases (5 males and 9 females) death was referred to disease of the liver or other diseases, under such circumstances that

alcohol was most probably the primary cause of death. Of these cases 3 males and 4 females were visitors.

Cancer caused 36 deaths (2 amongst visitors) as against 29 in 1898, and 33 in 1897. These were 13 males, and 23 females. There were 17 deaths from disease of the digestive organs, 8 from the liver, 4 from the uterus and its appendages, 2 from the breast, and 5 from diseases in other parts of the body.

The cancer death-rate was 0·747 as against 0·638 in 1898, and 0·820 in 1897.

The deaths due to tubercular affections other than phthisis, were 22, viz., 13 tubercular meningitis, 2 tuberculosis, 3 tubercular enteritis, 3 tabes mesenterica, and 1 tubercular disease of hip joint.

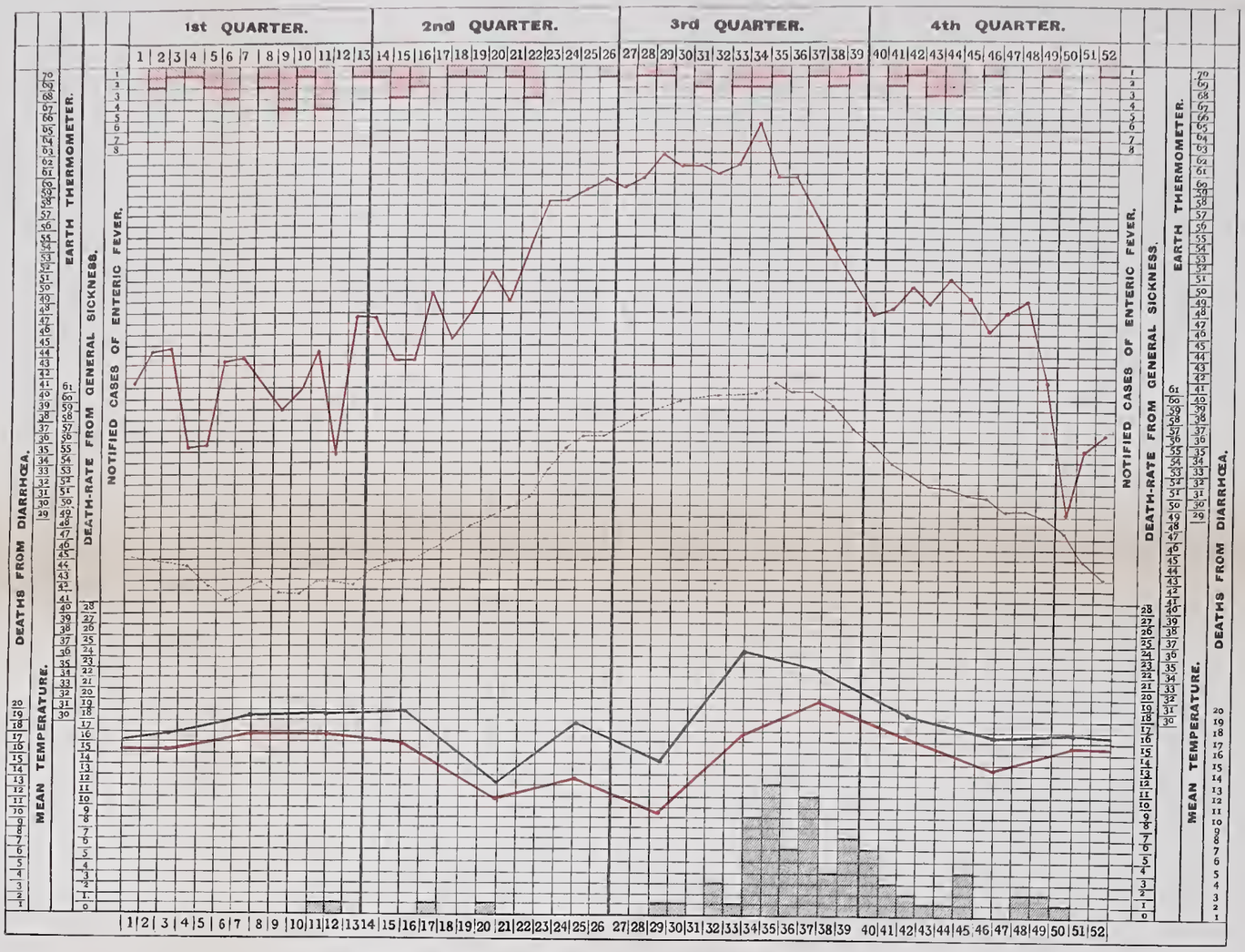
In one other case phthisis was mentioned as a secondary cause to diabetes.

The following twelve deaths occurred after confinement :— (i) disease of kidneys 9 months, uræmia 3 days, child-birth 9 days ; (ii) puerperal septicæmia 4 days, parturition 6 days ; (iii) pneumonia 17 days, parturition ; (iv) peritonitis 2 days, parturition 4 days ; (v) puerperal peritonitis 2 days ; (vi) Influenza 11 days, pneumonia 11 days, and confinement 8 days ; (vii) morbus cordis, bronchitis, parturition ; (viii) parturition, puerperal septicæmia, 28 days ; (ix) parturition, puerperal septicæmia, 4 days ; (x) parturition, placenta prævia, hæmorrhage ; (xi) parturition, placenta prævia, and pneumonia ; (xii) child-birth, 18 days, pneumonia 7 days.

The rate of deaths after confinement per 1,000 births was 9·86, as compared with 4·76 in 1898, 10·4 in 1897, and 6·38 in 1896.

Case No. (ii) was clearly due to infection having been carried by a so-called midwife, who had attended a fatal case of the disease a short time previously, outside the Borough. Cases (iii), (iv), and (v) occurred in the practice of one medical man. Case (viii) was attended by another so-called mid-wife.

CHART I.



DEATH-RATE (Monthly) FROM ALL DISEASES
Do. do. OF RESIDENTS ONLY
TOTAL DEATHS (Weekly) from DIARRHŒA
NOTIFIED CASES (Weekly) OF ENTERIC FEVER
MEAN TEMPERATURE (Weekly) at 9·0 a.m.
MEAN TEMPERATURE OF SOIL (Weekly) at Depth of Four Feet

CHART II.

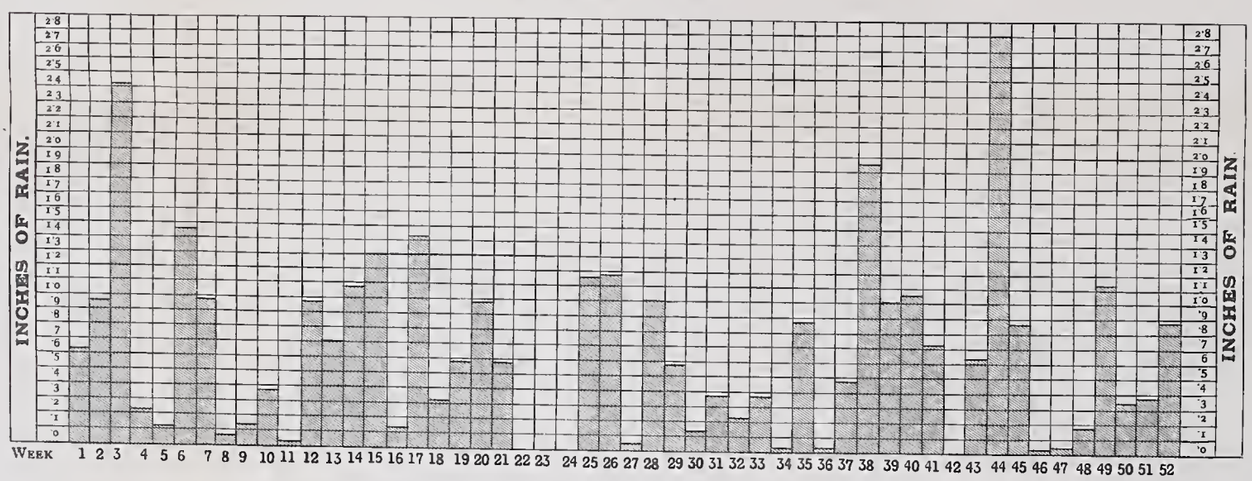
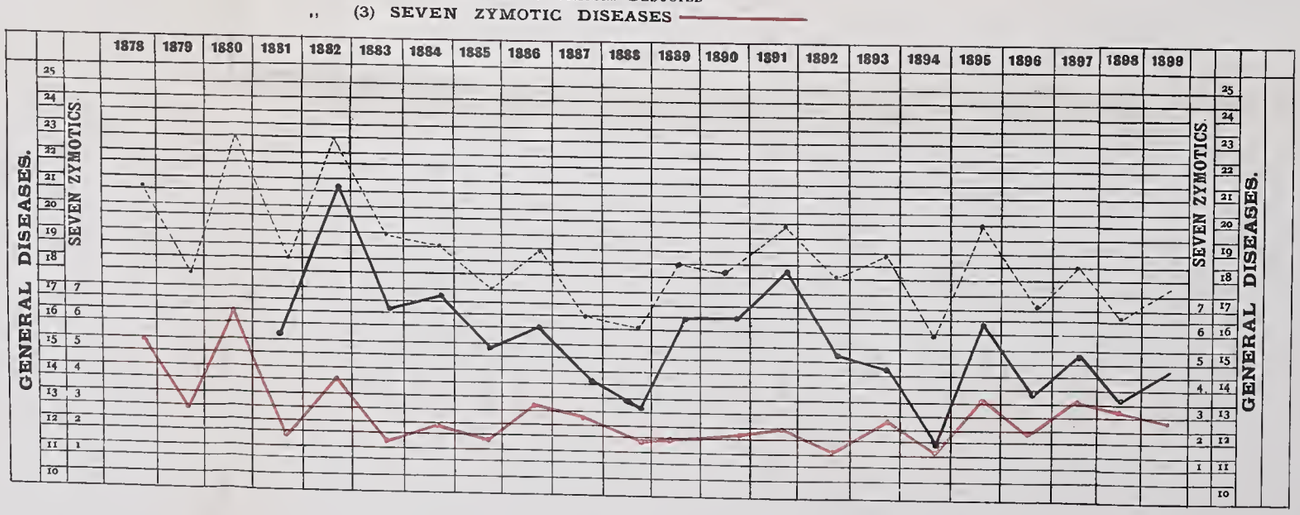


CHART III.

DEATH RATES.

From (1) GENERAL DISEASES ----------
,, (2) ,, ,, ————
DEATHS OF VISITORS DEDUCTED
,, (3) SEVEN ZYMOTIC DISEASES ————



The deaths from *injuries* were 14, 5 of whom were visitors, as compared with 16 in 1898, and 9 in 1897.

The *inquests* held during the year were 40, with the following verdicts:

Injuries—		
By falling	4	
By fire	3	
By being run over	3	
	—	10
Suicide—		
By hanging	2	
By cut-throat, poisoning, drowning, gun-shot, &c.	5	
	—	7
Natural causes		7
Accidentally drowned		4
Found drowned		3
Accidentally poisoned		2
Suffocation by being overlain		2
Want of attention at birth, shock, improper feeding, starvation		5
		40

There were 27 deaths, the causes of which were uncertified either by the Coroner or a Medical Practitioner. Therefore 3·13 per cent. of the total deaths were uncertified as compared with 3·37 in 1898.

Chart I. gives graphically the monthly death-rates, the black line giving the gross death-rates, the lower red line the corrected death-rates, the upper red line the mean weekly temperature. The lower shaded spaces denote the weekly deaths from diarrhœa, and the upper spaces shaded red the cases of enteric fever notified each week. The mean weekly temperature of the earth thermometer is denoted by the dotted red line.

Chart II. gives the rainfall for each week of the year.

Chart III. gives the several death-rates for the last twenty-one years.

Tables A, B, C, D, E, F, G, H, K, and L, in the Appendix, give further details of the vital and mortal statistics as compared with previous years.

The accompanying table (Table VI.) gives a revision of the deaths from 15 causes during the last twelve years.

TABLE VI.

	POPULATION.													
	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
	19,550	20,380	20,540	21,661	24,312	23,846 Census.	26,470	28,389	30,337	32,943	36,638	40,234	45,414	48,200
Small-pox	...	...	...	...	...	...	...	1	2	...	...	...	...	...
Measles	10	...	5	2	8	10	...	4	6	3	4	23	7	11
Scarlet Fever	5	12	4	1	5	4	4	11	4	11	9	6	5	4
Diphtheria	5	5	13	12	6	1	1	4	6	4	1	3	3	5
Whooping Cough	3	14	...	8	2	7	5	9	3	10	8	9	2	16
Croup, not spasmodic	8	4	4	6	8	4	1	4	3	..	5	2	2	...
Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Enteric Fever	6	4	7	8	3	4	4	5	8	12	13	15	16	16
Diarrhœa	25	18	5	11	23	24	10	41	13	69	33	52	101	81
Rheumatic Fever	5	2	1	...	2	4	1	2	3	2	4	7	3	7
Erysipelas	2	1	2	2	...	1	...	4	3	2	3	1	...	2
Phthisis	27	25	23	30	27	32	33	28	33	41	42	43	52	66
Bronchitis, Pneumonia and Pleurisy	65	61	62	64	95	137	102	118	67	131	112	150	138	152
Heart Disease	23	23	30	39	37	41	40	43	45	47	53	65	64	67
Injuries	11	6	7	15	8	15	8	7	11	14	16	9	16	14
Other diseases	175	151	159	204	227	217	279	251	274	315	327	360	363	421

II.—ACTION TAKEN TO PREVENT THE SPREAD OF DISEASE.

A.—Notification of Infectious Disease.

Notification of infectious disease has been enforced under Section 75 of the Blackpool Improvement Act, 1879, under which smallpox, infectious cholera, measles, typhus, typhoid, scarlet, relapsing or puerperal fever, or diphtheria, are notifiable diseases. This Section was repealed by the notification of (Infectious) Disease Act 1899, which came into operation on January 1st, 1900. I must again call attention to the fact that the occupier of a building in which a case of one of the notifiable diseases occurs is liable to the infliction of penalties if he does not forthwith notify the existence thereof to the Medical Officer of Health, and that he will not escape from the attendant troubles by purposely not calling in a medical man.

There is still a difficulty in obtaining notification of cases of "puerperal fever," but since an authoritative opinion on the subject has been obtained, it cannot be permissible to allow failure of notification to pass unnoticed on the grounds of the vagueness of the term "puerperal fever." In interpreting the law it is the usual practice of the Courts of Justice to determine what was in the mind of the Legislature at the time the Act was passed, and at that time the description of the disease contained in recognised text-books included many distinct affections. Since then these affections have been more accurately differentiated, and to such an extent that the term "puerperal fever" has been expunged from the last edition of the "Nomenclature of Diseases," issued with the authority of the Royal

College of Physicians, but it is there stated that puerperal septicæmia, puerperal pyæmia, and puerperal sapræmia, are frequently included under that term. To guide Medical Officers of Health in dealing with cases of failure to notify this class of disease, the London County Council sought the opinion of the Royal College of Physicians, London, in the later part of 1898, on the subject. The reply which was given after consideration by a committee, was : "That this Committee is of opinion that, with a view to the limitation of dangerous infectious diseases, the London County Council would be acting rightly in adopting the view that the expression "puerperal fever"; as contained in Section 55 of the Public Health (London) Act, 1891, should be taken to include septicæmia, pyæmia, septic peritonitis, septic metritis, and other acute septic inflammations in the pelvis, occurring as the direct result of child-birth."

The reply of the Obstetrical Society of London to a similiar question was: The Council of the Obstetrical Society is of opinion that most of the diseases mentioned are intended to be included under the name of "puerperal fever" in the Public Health Act. It is also of opinion that an inclusive definition should be added after the words "puerperal fever," in the following form—"That is septicæmia and pyæmia, including peritonitis, and all cases of acute pelvic inflammation occurring in connection with child-birth."

An authoritative opinion having now been obtained on this point from the highest medical authorities in the country, I shall now feel it my duty, if necessary, to recommend prosecutions for failure to notify the existence of cases which are intended to be included under the term "puerperal fever."

The following cases of infectious disease were notified during the year and are arranged in tabular form to shew the number of cases each month :—

TABLE VII.

Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Rotheln.....	1	...	...	..	...	...	...	...	...	...	...	...	1
Measles.....	28	35	91	38	16	16	20	18	15	77	8	8	370
Scarlet Fever ...	7	5	5	3	8	15	10	15	19	19	18	17	141
Diphtheria	1	...	3	...	...	1	1	3	...	1	1	2	13
Enteric Fever ...	4	7	10	7	3	2	2	6	5	6	4	3	59
Puerperal Fever	...	1	2	1	...	...	...	1	...	...	...	...	5
Totals.	41	48	111	49	27	34	33	43	39	103	31	30	589

The number of houses infected with the different diseases is given in the following table :—

TABLE VIII.

NUMBER OF HOUSES INFECTED.

Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Rotheln.....	1	...	...	...	...	...	...	...	...	...	...	...	1
Measles...	16	20	59	23	11	10	12	16	11	49	6	7	240
Scarlet Fever ...	5	5	3	3	5	11	9	15	17	14	14	9	110
Diphtheria	1	...	2	..	...	1	1	3	...	1	1	2	12
Enteric Fever ...	4	7	8	7	3	2	2	6	5	5	4	2	55
Puerperal Fever	...	1	2	1	...	...	...	1	...	...	...	...	5
Totals.....	27	33	74	34	19	24	24	41	33	69	25	20	423

The accompanying Table gives the number of infectious cases notified as compared with the previous year, the deaths from these diseases, the percentage case mortality, and the death-rate from each disease per 1,000 inhabitants in comparison with the similar rates for the 33 great towns during 1899.

TABLE IX.

Disease.	Cases Notified.		Cases Notified per 1,000 inhabitants.	Deaths in 1899.	D.P. per 100 cases.	D.R. per 1,000 inhabitants.	D.R. per 1,000 inhab. for 33 great towns.
	1899	1898					
Smallpox	...	...	...	...	...	...	0·01
Measles	370	259	7·676	11	2·97	0·228	0·46
Scarlet Fever	141	77	2·925	4	2·83	0·082	0·13
Diphtheria	13	10	0·269	5	38·46	0·103	0·40
Enteric Fever	59	67	1·224	16	27·11	0·331	0.22
Typhus Fever	...	...	...	...	...	...	
Puerperal Fever ...	5	6	0·103	5	...	0·103	...
Whooping Cough...	...	...	...	16	...	0·331	0·38
Diarrhœa	...	...	...	81	...	1·68	1·21

The cost of notification in fees to medical men has been as follows :—

	£	s.	d.
Measles.....	27	17	6
Scarlet Fever	13	5	0
Diphtheria	1	7	6
Enteric Fever	6	0	0
Puerperal Fever.....		10	0
	£49	0	0

Smallpox.

No case of this disease was notified during the year, and we have therefore been free from smallpox since August, 1895. The objectionable "conscientious objector" clause does not seem to have found many adherents in this district, and seems to be less and less availed of in all districts, even in those where the anti-vaccination craze is most rife. The improved administration of the vaccination laws brought about by the Vaccination Act of 1898, is tending also not only to a greater proportion of the populace being protected by vaccination, but also to that portion being more effectually protected by more efficient vaccination. But in spite of this there is no doubt that there is always the danger of the introduction of the infection into our midst, and the spread of the disease amongst the unprotected. I, therefore, congratulate the Corporation on having become one of the constituent authorities of the Fylde, Preston and Garstang Joint Hospital Committee for the provision of a smallpox hospital. It is to be hoped that the erection of this hospital will be pushed forward with all due speed, and that it will be in a state of readiness before the necessity for it in this district may arise.

Measles.

The end of 1898 found us in the midst of an epidemic of the disease. All the schools were kept closed until January 16th, the known cases dropping from 117 in December, to 28 in January.

The number of cases increased slightly in February and much more so in March, being chiefly caused by infection being spread by the Kent Road school. This abated by the end of April, and the cases until the end of September were few and were mostly imported. In the beginning of October it was clear that the disease was being caused by the aggregation of children in the Infant Department of St. John's Schools. This department was therefore closed on my certificate from October 13th, to October 30th.

The 77 cases in October were succeeded by only 8 each in both November and December. The result of further experience is to more thoroughly convince me of the value of the notification of the disease, but to be of use it must be accompanied by prompt and firm closure of infected schools. That is to say the cases notified must be carefully inquired into, and as soon as it becomes evident that one particular school, department, or even class of that school is at fault—a decision which ought not to be difficult to make for anyone accustomed to deal with such inquiries—that school, department, or class ought to be closed, at the same time warning all other schools of such closure, and against admitting scholars from the affected school. In this manner, I believe the ravages of this disease, so difficult to deal with in a preventive manner, can be curtailed with the minimum of interference with the education of the children, and of friction with the school authorities.

During the year there were 370 cases with 11 deaths. Eleven only of these were admitted into the hospital, none of which died.

Foxhall and Talbot Wards were chiefly affected, corresponding to the districts served by Kent Road and St. John's Schools.

Scarlet Fever.

There were 141 cases with 4 deaths, or a case mortality of 2·83 per cent., and a death-rate of 0·082. The case mortality and death-rate were less than in any year since 1889. It is quite evident that the disease is progressively becoming of a milder type in this district, but this satisfactory feature is at the same time one which makes the prevention of the disease more difficult by the non-recognition of slight cases. Thus, the cases were twice as many as in 1898, and have only been exceeded in the years 1895 to 1897. In fact, from the several times that we have discovered cases of the disease attending school whilst desquamating the wonder rather is that the cases have been as few as they have turned out to be.

The disease was most prevalent in September, October, November, December, August, and June, being distributed chiefly in Talbot, Foxhall, and Claremont Wards.

"Return cases" of the disease have, as formerly, been occasionally troublesome. By "return case" I mean a case which occurs within three weeks of the return of another case from an infectious diseases hospital to his home or shortly after the visit of a patient either recently discharged from hospital or his own home, as free from infection.

The following occurrences in this connection are significant and show how peculiarly situated Blackpool is with regard to the introduction of infection from without :—

(i) On April 11th the rash of scarlet fever developed in a girl who lived in a house where a child was brought on April 8th, after suffering from scarlet fever for just over eight weeks in a Lancashire town.

(ii) On May 18th, two children were found to have a scarlatinal rash, and it was then found that the mother and another child had been in a large, well-known, and well-conducted infectious diseases hospital in a Lancashire Borough from March 28th to May 6th. On May 18th I thought there were still signs of desquamation in the two who had been in hospital, and I therefore had all four removed to hospital.

(iii) One case in connection with our own infectious diseases hospital. A boy was admitted on October 2nd, and discharged on November 27th. His brother took scarlet fever, and was admitted on December 6th, the first day of the rash.

Of the 8 cases in May, 6 were imported.

In June, through the notification of a case of the disease, four unrecognised cases of the disease in various stages of desquamation and development were discovered in a house in another part of the Borough, and in one of its busiest business streets.

There were two imported cases in June.

There is the difficulty of the case being so slight as to escape recognition and only to be discovered when a subsequent case occurs. Thus a medical man was called in on June 14th, a rash was noticed on June 17th, but no diagnosis of scarlet fever was arrived at until July 5th, when another child became affected. Again, a medical man was called in to see a case on June 12th, and I was told a rash appeared on that day, but it was not notified until July 8th, when desquamation was well pronounced. A third instance of this was in December, when a girl was found desquamating fifteen days after the onset of the rash, through a younger sister being unmistakably affected with the disease.

I do not mention these in the spirit of fault-finding with the medical men concerned, but rather to point out the difficulties that they have to deal with, and the necessity for the exercise of the greatest caution in dealing with cases in which there is the slightest suspicion of scarlet fever. I am at all times willing to assist in such cases, either by giving advice or making use to their utmost extent of all the appliances that the Corporation have placed in my hands for dealing with infectious cases.

The imported cases were one in July, five in August, three in September (one being a resident who came home already ill), and six in October. Four visitors appear to have contracted the infection in Blackpool.

I visited a school in consequence of an anonymous letter and the occurrence of two cases of scarlet fever amongst its scholars. I found in the school two girls who were most markedly "peeling" after scarlet fever. Fortunately, by their exclusion and disinfection of the school buildings, no further cases in connection with it became known to me. To my mind it is most advisable that it should be the duty of some official with a medical qualification to visit each public elementary school at least once a week, to inspect each scholar, and to impress upon the masters, mistresses, and teachers, the necessity of closely watching the health of their scholars, paying particular attention to symptoms of infectious disease, and to inform him at once of anything suspicious.

Diphtheria.

There were 13 cases of this disease notified with 5 deaths, as compared with 10 cases and 3 deaths in 1898. There was no death ascribed to "membranous croup," as opposed to two in 1898, so that there were practically the same number of deaths this year as in the former.

Fortunately this disease does not seem to be able to take root in Blackpool, although I feel that some slight cases must escape notice. It is to be hoped that the offer of the Sanitary Committee to have swabs of the throat, from all suspicious cases, examined for the presence of diphtheria bacilli free of charge, will be availed of. Towards the end of the year it was found useful. Thus, of the two cases in December, in one the bacilli were not present, whilst in the other, which was a fatal case, they were present. In this case the disease had no doubt been imported from London. One case was that of a visitor, who was ill on arrival. Another case was a resident who arrived here from North Wales (where the disease was prevalent) already ill of the disease.

Enteric Fever.

There were 59 cases of the disease, with 16 deaths, as compared with 67 cases and 16 deaths in 1898. The case mortality 27·1 per 100 cases, is very high; this, I ascribe to two causes, one to a number of mild cases not being recognised, and the other to the severe type of the disease prevalent in this district. The death-rate from enteric fever was 0·331, as compared with 0·352 in 1898.

Two of the deaths were of cases notified in 1898, and therefore are not reckoned in the 59 cases, whilst one of the cases notified in December, 1899, has since died, and will be included in the deaths of 1900.

It is essential that cases of this disease should be notified as soon as possible, not only because of preventing the spread of the infection, but also to enable the case to be removed to hospital before it becomes so ill that removal is fraught with great danger.

Foxhall Ward was the most severely affected.

Now that the offer to have the blood-serum tested for Widal's reaction, free of charge, has been made by the Sanitary Committee it is to be hoped that it will be generally availed of in every case of continued fever without an obvious cause for the continuance of that fever. There is little doubt that the disease is more directly infectious than is usually considered the case. For more detailed information see the special report on the prevalence of enteric fever in the town.

Phthisis or Consumption.

There were 66 deaths from this cause, 11 of them being visitors. As in former years, an offer was made in each case to disinfect the house and premises. In 14 cases this offer was taken advantage of.

Diarrhœa.

There were 81 deaths which I classified as due to diarrhœa, viz. :—66 under 1 year old, 7 over 1 year and under 2 years old, 3 between 3 and 4 years old, 2 between 25 and 65 years old, and 3 over 65 years of age. Of the 66 children under 1 year old, 6 were illegitimate.

In Talbot Ward there were 28 deaths, in Foxhall 25, in Waterloo 11, in Brunswick 10, in Claremont 6, and in Bank Hey 1.

In the five weeks ending August 5th, there were 2 deaths, in the four weeks ending September 2nd, 25 deaths, in the four weeks ending September 30th, 28 deaths, and in the five weeks ending November 4th, 13 deaths.

In the first and second quarters there were 2 deaths each, in the third quarter 55, and in the fourth 22 deaths.

In Chart I. the relation between the deaths from diarrhœa, the temperature of the air, the temperature of the earth at a depth of four feet, and the notified cases of enteric fever is shown graphically.

It will thence be seen that the earth temperature rose over 56° F. in the 25th week, and remained so until the 40th week of the year. The deaths from diarrhœa were chiefly from the 34th to the

40th week. For further details I must refer the reader to the special report on diarrhœa and enteric fever.

Isolation.

The percentage of cases of scarlet fever removed to the Infectious Diseases Hospital was 84·4, *i.e.*, slightly less than in 1898.

The cases of enteric fever removed were 52 per cent. of the whole.

I have again to express my satisfaction with the manner in which the Matron, Miss Cain, and her staff of nurses have carried out their duties, and to thank them for the ready and willing help which they have always given me. Unfortunately, towards the end of the year, one of the probationers, contracted scarlet fever and succumbed very rapidly and unexpectedly to the malady.

The staff now consists of a matron, head nurse, nurse and five probationers, with a cook, two domestic servants, laundress wardmaid, gardener, and two porters.

TABLE X.

Patients admitted to the Sanatorium during the Year 1899.

No. of cases notified.	DISEASES.	Total admtd.	MALES. Under 12 years	MALES. Over 12 years	FEMALES. Under 12 years	FEMALES. Over 12 years	Discharged.	Died	Remaining in Hospital, Dec. 31st, 1899	Remaining in Hospital, Dec. 31st, 1898
141	Scarlet Fever ...	119	38	9	49	23	99	3	21	4
59	Enteric Fever...	31	5	12	4	10	25	8	..	2
13	Diphtheria	6	2	2	1	1	5	1	...	...
370	Measles	11	6	...	3	2	16	...	...	5
1	Rotheln	...	...	...	..	...	...	...	...	...
5	Puerperal Fever	...	...	...	...	...	...	...	...	...
...	Measles outside Borough ...	1	...	...	1	...	1	...	...	...
...	Scarlet Fever outside Boro'	5	...	...	3	2	4	1	...	...
...	Other Diseases outside Boro'	1	...	...	1	...	...	1	...	...
...	Enteric Fever outside Boro'	4	1	1	...	2	4	...	...	...
589	Totals.....	178	52	24	62	40	154	14	21	11

No case was admitted into the old Sanatorium during the year.

Of the eight deaths of enteric fever, one died on the day of admission, and one on the 4th day after admission.

Of the three deaths from scarlet fever, two died on the 3rd day after admission.

In Table XI. I give the number of cases treated in the hospital since it was opened in 1891, and also the percentage mortality amongst them as compared with that amongst the patients treated outside during the same time. In all instances the mortality in hospital is less.

TABLE XI.

Disease.	Cases treated in Hospital	Deaths.	Per cent. of Mortality.	Cases treated at Home.	Deaths.	Per cent. of Mortality.
Measles.....	232	1	·431	2138	66	3·08
Scarlet Fever.....	831	35	4·21	250	23	9·2
Enteric Fever.....	258	46	17·8	220	46	20·9
Diphtheria	43	12	27·9	45	16	35·5
Typhus Fever.....	1	1	100	...	...	...
Other Diseases.....	11	4	...	...	...	...
Totals.....	1376	99	7·19	2653	151	5·69

For the financial year, ending March 31st, 1900, the cost of the hospitals was, as nearly as can be determined, at the present moment :

	£	£
INFECTIOUS DISEASES HOSPITAL.		
Matron	60	
Porters	58	
Nurses and their Expenses	126	
Provisions for Inmates Staff, etc	489	
Domestic Servants and Laundress	74	
Gas, Coal, Water Rates and Taxes	187	
Alterations and Repairs	384	
Gardening	162	
Medicine and Medical Appliances	23	
Advertising, Printing and Stationery	10	
Miscellaneous	204	
	1,777	
Excess of Cost of building House over sanction to borrow	143	
	1,920	
Less Receipts from Inmates	184	
	1,736	
Interest and Sinking Fund	358	
		2,094
OLD SANATORIUM.		
Rent of Site	6	
Caretaker	4	
Gas, Coke, Coal and Water	8	
Repairs	1	19
		£2113

During the Financial-year, April 1st, 1899, to March 31st. 1900, the average stay in the hospital of the 178 patients was 46·82 or 8,334 days.

Not including in the Hospital, the Interest and Sinking Fund and also amount of money spent on house in excess of capital, the cost per week (per patient) was £1 9s. 10.2d., or £77 12s. 2 4d. per year, as compared with £1 10s. 0·1d. per week for 1898.

Deducting the amount received from patients and including interest and sinking fund and amount of money spent in excess of capital, the actual cost, to the ratepayers, of each patient averaged £1 15s. 2·1d. per week, as compared with £1 15s. 8·5d. per week in the financial year 1898-9. In this cost the cost of disinfecting articles sent from the Borough to be disinfected is included

III.—GENERAL SANITARY CONDITION OF THE DISTRICT.

I give hereunder the figures for the 52 weeks, ending December 16th, 1899, as compared with the similar figures for the previous year :—

		1898.	1899.
Complaints received		114	87
Houses and other premises inspected		2552	4248
Houses where sanitary defects were found		1181	2060
Houses and other premises re-inspected...		3032	2250
Notices served for the Abatement of Nuisances.	Council	205	217
	Preliminary ...	838	676
	Verbal	93	70
	Letters	158	137
		1294	1100
HOUSE DRAINS TESTED—			
New Houses { satisfactory		930	375
New Houses { unsatisfactory...		244	141
Other Houses { satisfactory		361	490
Other Houses { unsatisfactory..		1027	1172
House drains re-tested		503	648
Total number of tests made		3065	2826
Number of sanitary defects repaired		2388	1850
Houses where sanitary defects were repaired		506	414
DRAINS—			
Drains laid, re-laid, and disconnected		367	383
Drains repaired and cleaned out		118	120
Unsuitable gully traps replaced by properly trapped gullies, and new gullies fixed		288	158
W.C.'s—			
New w.c.'s fixed in lieu of privies and defective w.c.'s ...		56	58
Waterclosets repaired...		255	260
Fittings and water provided for w.c.'s		85	83
W.C. Soil pipes repaired and ventilated...		151	72

	1898.	1899
Refuse Receptacles—		
Ashpits abolished	27	25
Ashtubs provided	51	18
Ashpits rebuilt on approved system	23	32
Manure receptacles provided	2	7
Cesspools abolished	34	28
Pail closets substituted for privies	—	5
Waste Pipes—		
Bath, lavatory, slopstone, and rainwater waste pipes, disconnected over gullies	123	137
New slopstone waste pipes fixed	83	84
New rain-water pipes fixed	47	21
Rain-water pipes and roof gutters repaired	35	47
Slop-hopper waste pipes treated as soil pipes	12	—
Miscellaneous—		
Houses cleaned and limewashed	7	5
Walls of houses cemented	4	—
Floors re-laid with flags or in cement	43	41
Back yards repaired	108	57
Back yards flagged	288	327
Back yards concreted	—	5
Back passages cleansed	31	1
Accumulations removed	57	62
Animals removed from improper situations	1	2
Roofs repaired	17	—
Rooms ventilated	3	–
Letters (other than those relating to nuisances)	631	804
Foundations of houses drained	2	—
Sewers unblocked	—	2

The above is a satisfactory amount of work done in inspecting the drains of new houses, and in improving the sanitary condition of occupied houses. In this connection, mere numbers are not so important as the thoroughness of the work, and the insistence upon a high standard of workmanship. I feel sure that we have had better work done than in any previous year, and now that the battle of "cement joints" versus so-called clay puddle joints has been fought and won by the former, the work will be of a permanent nature, will lighten the labours of this department, and will be a relief both to owners and occupiers of property from the frequent disturbance caused by having the "drains up." I still regret, however, that the

Council refused to sanction the proposal of the Sanitary Committee to insist upon drains proving satisfactory to the " water test."

Now that fewer new houses are being built, the drain-testers have more time to devote to investigating the drains of occupied houses. Thus, during the year, 1662 of such houses were investigated, in 490 of which no defect of any description was found, *i.e.*, in 29 per cent. of the houses as compared with a per centage of 26 in 1898.

I have still to complain of the sites of new houses not being asphalted or concreted as demanded by the byelaw in that behalf, and the provision of wooden floors over the uneven ground. To my mind this is one of the greatest defects that can exist about a house, and in certain localities it results in people living over a layer of stagnant water for a great portion of the year without knowing it.

UNSOUND FOOD.

This part of the report refers to food either found to be unwholesome or brought to the Public Health Office. It does not include that discovered at the Public Slaughter-house, which is dealt with in that section of the report. I have divided it into two portions, that destroyed with the owners' consent, and that in which a magistrates' order was obtained for its destruction.

DESTROYED UNDER MAGISTRATES' ORDERS :—

33 lbs. of pears. 3 ducks and 5 rabbits.

In the latter case a prosecution was taken for exposing the ducks and rabbits for sale, and defendant was fined £2 and costs.

DESTROYED WITH OWNERS' CONSENT :—

Carcase of 1 pig.
14 lbs. of beef.
14 lbs. of mutton.
1 bag of cockles.
48 rabbits.
8 pairs of kippers.
6 lbs. of soles.
28 lbs. of shrimps.
30 lbs. of apples.
5 baskets of mushrooms.
7½ lbs. of tomatoes.
70 lbs. of strawberries.

SALE OF FOOD AND DRUGS ACTS.

The following samples were taken for analysis under the procedure enjoined by the above Acts :—

Butter	7	Lard	1
Coffee	5	Pepper	1
Malt Vinegar	2	Butter Substitutes	2
New Milk	23		
		Total	41

The samples were all pronounced to be genuine except in the case of milk.

Of these 3 were said to be "rich milk," 9 "genuine," and 3 "passable."

One sample of new milk contained 2·49% of fat, 9·03% of other solids, and was certified as having been deprived of part of its cream.

A sample of new milk taken shortly afterwards at the same place, whilst in course of delivery to the retailer, was certified to contain 2·99% of fat, 8·45% of other solids, and that it contained formalin as a preservative. Prosecutions were instituted in both these cases. The wholesale dealer pleaded guilty to the addition of formalin, pleaded ignorance of its deleterious properties, and promised not to use it again. The magistrates allowed the summons to be withdrawn on the payment of costs. The summons was withdrawn in the first case.

Another sample was certified to contain 3·45% of fat, and 8·23% of other solids, and to be slightly watered and very poor in solids. In face of the certificate stating it was *slightly* watered and that it contained above 3 per cent. of fat, no prosecution was taken.

A sample of new milk was found to contain 2·27% of fat and 9% of other solids.

In accordance with the usual custom, a sample of the milk was taken as it came from the cows. This was on June 22nd, *i.e.*,

13 days after the first sample, June 9th. The report was that it was deficient in cream.

On the same day, June 9th, a sample of milk was taken from another farmer, and was reported to be deficient in cream. The report from the analyst of the milk, taken from the cows in the Inspector's presence, was that it was "rather deficient" in cream.

Prosecutions were instituted in both these cases, but evidence was brought by the defence to prove that it was not possible to have abstracted any cream, and that the milk was taken straight from the cowsheds to the Borough. It was also stated that the continuous drought had effected the cows so much that they were yielding poor milk. At the end of the hearing the magistrates dismissed both cases.

Whilst inspecting bake-houses, I found some substances of an objectionable look being used in place of butter or lard for making pastry, and called in the trade "vegetole" and "cotolene." I had these analysed, and "vegetole" was reported to consist of a mixture of beef stearin and cotton-seed oil, and "cotolene" of a mixture of beef stearin and cotton-seed oil and a little lard.

INFECTIOUS DISEASES.

	1898.	1899.
Inquiries made into cases of infectious disease	332	458
Houses disinfected after cases of infectious disease... ...	234	458
Houses disinfected after cases of consumption	13	14
Isolation notices served upon householders	332	458
Isolation notices served upon school managers	153	223

ARTICLES REMOVED FROM 208 HOUSES TO SANATORIUM—

Sheets, quilts, blankets, and such	1177	Carpets	258
Articles of clothing	1181	Rugs and Mats	172
Pillows and bolsters	762	Curtains	195
Books	35	Cushions	54
Beds	277	Table-cloths	19
Mattresses	333	Miscellaneous Articles ...	586

Total number of articles disinfected, 5049, and also 3362 articles from the Sanatorium

Total 8,411.

SMOKE OBSERVATIONS.

During the year there were 11 observations as compared with 30 in 1898.

When "black smoke" was emitted longer than $2\frac{1}{2}$ minutes in half an hour a prosecution was taken.

In each of two cases there was a fine of 10s. and costs for creating a nuisance, and an order for its abatement was issued.

In another case there was a fine of £5 and costs, and subsequently a fine of 10s. and costs for disregarding an order of the Court to abate the nuisance. Later on in the year, the same firm was fined £3 and costs for still neglecting to obey the order of the Court, *i.e.*, this firm elected to pay £8 10s. and costs rather than abate the nuisance. The effect of the crusade in this and the previous year has been to materially improve the nuisance arising from the emission of black smoke from chimneys other than those of dwelling houses.

B.—Water Supply.

There were many complaints of the turbidity of the water supplied for drinking purposes, but these chiefly arose from the disturbance which took place when the new 24 inch main from the reservoir direct to Blackpool was being connected to the old mains. But apart from that there does not appear to be any improvement in the filtration of water over former years. It is essential that the efficiency of the filters should be regularly tested and reported upon by someone who is acquainted with the subject, and that reliance should not be placed upon a rule of thumb method of doing the work.

C.—Removal and Disposal of Household Refuse.

The completion of the sewerage schemes and the abolition of cesspools for the collection of slop-water has materially lightened the work of this department. The drains of houses in these portions of the Borough are being attached to the sewers as rapidly as possible.

SUMMARY OF WORK DONE.

	1898.	1899.	Increase or Decrease.
Loads of refuse carted to destructor	24,313	25,531	† 1,218
Do. do. tip.....	23	160	— 137
Do. do. on land in Borough	6,334	2,991	— 3,343
Total loads of refuse carted	30,734	28,798	— 1,988
Do. coke carted to cremators	64	116	† 52
Total loads of refuse and coke	30,734	28,798	— 1,936

The sign † means increase, and — decrease.

On December 31st, 1899, it was found that there were :—

	1899.	1898.
Houses with ashtubs	9,113	8,920
Houses with ashpits	497	419
Houses with modified ashpits	366	359
Houses with no proper receptacle.....	112	142
Total houses.....	10,088	9,840
Houses with cesspools.....	62	84
Houses with pail-closets	132	258
Houses with privies.....	78	88
No. of shops with dwelling houses attached	918	1,751
No. of lock-up shops	627	
Stalls and office premises, &c.	206	
No. of ashpits in Borough	294	281
Do. modified ashpits in Borough	366	359
Do. privies	62	66
Do. cesspools	27	44

It will be noted that the decrease in the number of loads carted during the year, that is 1988, is owing to a great diminution in the No. of loads of refuse carted on land, viz., from 6,334 loads to 2,991 loads in 1899. This refuse is mostly the liquid contents of cesspools, and the disappearance of this objectionable method of sewage storage and disposal is responsible for this diminution.

For the financial year, April 1st, 1899, to March, 31st, 1900, the cost of emptying ashpits as nearly as can be ascertained at the present date was £4,513, *i.e.*, per inhabited house of 9s. 1·1d., as compared with 9s. 9·7d. in 1898–99.

The number of loads of refuse and coke carted in the financial year was 28,733 that is 3s. 1·7d. per load, as compared with 2s. 10·9d. per load in 1898-99.

The cost of the refuse destructor during the financial year, including interest and sinking fund was £3,495 and the loads burnt 25,919, at a cost of 2s. 8·3d. per load consumed, as compared with 2s. 1·4d. per load in 1898-99.

D.—The Public Slaughter-Houses.

During the year the following animals have been slaughtered in the slaughter-houses of the Corporation as compared with the previous year.

	1898		1899
Beasts—Cows	197		234
Heifers	1,143		1,224
Bullocks	325		455
Bulls	1		10
	1,666		1,923
Calves	449		461
Sheep	24,619		29,059
Pigs	1,347		1,175
Totals	28,081		32,618

The livers of 357 animals—241 sheep, 73 heifers, 13 cows, and 30 bullocks—were found affected with "flukes" and were destroyed.

The livers of 9 heifers, 5 cows, and 4 bullocks were found to contain "abscesses," and were seized.

The livers of 14 pigs were in a condition of cirrhosis.

Three sheep and one lamb were found dead in the field, and one lamb died during transit on the railway. These were all destroyed.

In one carcase of a sheep a portion was much bruised, so that 36lbs. of mutton were seized.

The animals affected with tuberculosis in varying degrees were 20 cows, 8 heifers, 1 bullock, and 9 pigs

In all these cases the viscera were detained and burnt, the carcase being carefully dressed by the removal of all the lymphatic glands.

In one case, the whole carcase of a cow, weight 475 lbs., was seized, and in others only a portion, the weight of beef thus seized being 848 lbs., *i.e.*, 1,323 lbs. of beef altogether.

Of the nine pigs, the whole carcase was seized in four instances, weighing in *toto* 456 lbs., and of the other five pigs 223½ lbs. of pork was seized, *i.e.*, 679½ lbs. of pork.

Of the 20 cows as the result of the post-mortem examination of all the organs and lymphatic glands, I am of opinion that in 10 cases the infection entered the animal by the intestines, in 7 cases by the lungs, and in 3 cases it was questionable whether the lungs or mesenteric glands commenced first.

Of the eight heifers, the disease appeared to have commenced in three instances in the lungs, three in the mesenteric glands, and two were very questionable as to which was the original seat of the disease. In no case was the mammary gland found affected with tubercle as far as could be made out with the unaided eye ; but in three cases the submammary lymphatic gland was affected.

In the bullock, the cause of infection seemed to be from the mouth through the submaxillary glands.

At the present time eight of the ten slaughter-houses are let to the following butchers :—Messrs. Cocker, Thomas, Bridge, Lawrence Hull, Sowerby, Rainford, Holt, Sykes, Ashurst, Robert Hull, and the Blackpool Co-operative Society.

The public slaughter-house is regularly used by Messrs. Barlow, Carter, Carver, Collins, Cropper, Fish, Flintoff, Garsden, J. Harrison, R. Harrison, Laycock, Miller, Mitchell, Noble, Waring, Whetman, and Wilkinson. Mr. E. Ashurst, of Lytham, also slaughters here. Others occasionally use it.

The pig slaughter-house is regularly used by Messrs. Gregson, Hornung, Moxon, Robinson, Walker, and the Co-operative Society.

The public have now the satisfaction of knowing that the above-mentioned firms so conduct their business that both the animals and the carcases are subject to the inspection of public officials in every instance.

A number of butchers have erected more or less unsuitable slaughter-houses just outside the Borough so as to escape inspection, but it is to be hoped that we shall get power to demand that the viscera and carcases of all animals slaughtered outside the Borough, if not already inspected by a public official, shall be brought to a central station for the purposes of inspection.

IV.—METEOROLOGY.

The observations have been taken by Mr. T. Sanderson, Sanitary Inspector, assisted by other members of the Sanitary Staff. During the season, telegraphic messages of the state of the weather were sent each forenoon to the *Manchester Evening News*, and throughout the year to the *Lancashire Daily Post.*

The equipment of the department consists of :—

(i.) A Standard Fortin barometer kept at the Infectious Diseases Hospital.

(ii.) A Stevenson-screen containing wet and dry bulb and maximum and minimum thermometers.

(iii.) An earth thermometer at a depth of four feet.

(iv.) A rain guage.

(v.) A Campbell-Stokes Sunshine Recorder kept at the Infectious Diseases Hospital.

(vi.) A wind vane and an anemometer on the North Pier.

The Stevenson-screen, with the thermometers and rain guage, is kept at the Infectious Diseases Hospital.

On several occasions the sunshine cards were tampered with, so that the sunshine recorded on those days is not correct.

The Campbell-Stokes recorder gives lower readings than other forms of sunshine recorders.

The tables at the end of the report give the result of the observations for the year. I append here a short summary of the weather

for each month of the year. The observations are taken daily at 9 a.m.

January had rain on each day until the 22nd. The temperature was 3·1 degrees above the average, 1·5 degrees above that of Stonyhurst, and 0·7° above the Manchester mean temperature. Frost occurred on eight nights. The pressure was variable, the range of the barometer being 1·75 inches. The rainfall was 1·4 inches above the average. There were 38·7 hours of bright sunshine, and 16 per cent. of possible duration, being 1 per cent. above the average. The anemometer was out of order from January 13th to February 2nd. The sunshine card of January 23rd was stolen on that day. The sun was shining most of the day, but by comparing our observations with those of similar stations for that day, the Meteorological Office have allowed 2·6 hours bright sunshine.

February was dull and cold on the whole until the 20th, after which it was bright with high readings of the barometer. The temperature of the month was 1·3° above the average, about 0·5 above Stonyhurst, and practically the same as that of Manchester. There was frost on thirteen nights, with a fall of 1¼ inches of snow on the 4th. The barometric pressure was very low about the 12th of the month, and very high at the end. Rain fell on 14 days and was very slightly above the average. The hours of bright sunshine were 77·7 or 29 per cent. of the possible duration, *i.e.*, 6 per cent. above the average.

March was on the whole a fair, bright, and dry month. The temperature was 0·5 degrees above the average, 1·1 degrees above Stonyhurst, and 0·3 degrees above Manchester. There were ten frosty nights, with slight fall of snow on the 4th. The barometric pressure was much above the average, with the high range of 1·636 inches for the month of March. Rainfall was equal to the average being 2·19 degrees. There were 130 hours bright sunshine, *i.e.* 36 per cent of possible duration, being 8 per cent. above the average.

April was a very changeable month with frequent falls of rain, some particularly heavy, as on the 13th, which was accompanied with a thunderstorm. The average temperature was 0·2 degrees above the average for 25 years, 1·5 degrees above Stonyhurst, and 1·1 degrees above Manchester. There were 3 nights of slight frost. Barometric pressure was below the average. On the 7th, a depression passed over us, we being in the centre of its track. This was accompanied with strong winds from the North West, the velocity in the 24 hours being 1,135 miles. The rainfall was 3·93 inches, being 2·29 inches above the average. Rain fell on 22 days. The hours of bright sunshine were 112·8 hours, *i.e.* 27 per cent of possible duration, being 8 per cent below the average. On April 30th, the sunshine card was tampered with. The anemometer was taken down for repairs on April 21st, and was not erected again until May 15th.

May was bright and fair until the 10th, and again from the 24th, to the end of the month, but was very unsettled in the intervening period. The temperature was below the average by 1·7 degrees but was above Stonyhurst by 0·7 degrees, and Manchester by 0·4 degrees.. There was frost on the night of the 4th. Barometric pressure was above the average. Rainfall was 0·44 inches above the average, falling on 16 days. Bright sunshine was 171·1 hours, was 35 per cent of possible duration, being 4 per cent below the average. On May 3rd, no sunshine was recorded, the glass ball being found off the stand when the observer went on the 4th.

June was extremely fine and dry to the 17th, and was then very unsettled until the end of the month. The mean temperature was 59·1 degrees or 2·5 degrees above the average, being practically the same as Manchester and Stonyhurst. Barometric pressure was above the average. The rainfall was 2·07 inches, collected on 9 days. There was a drought from May 24th to June 17th. A heavy thunderstorm with very heavy rainfall occured on June 20th, the storm lasted from 3-20 p.m. to 4-15 p.m., and the rain from 3-45 p.m. to 4-20 p.m., with a fall of 0·43 inches during the time. On June 28th

there was a thunderstorm from 5-45 p.m. to 7-5 p.m. Hours of bright sunshine were 253, percentage of possible duration 50 per cent., being 12 per cent. above the average.

July was a changeable month, with a deficiency of bright sunshine. It was warmer than usual, being 1·4 degrees above the average, 0·6 degrees above Stonyhurst, and 0·7 degrees below Manchester. Barometric pressure was above the average, but on the 1st and 2nd a depression passed directly over us accompanied by strong westerly winds. The rainfall was only 2 inches, being 1·15 inches below the average. Bright sunshine was 171·6 hours, with a percentage of possible duration of 34 per cent. There were three slight thunderstorms, one at 9 p.m. on July 19th, one at 2 a.m., and another at 4 a.m. on July 20th.

August was fine, warm, and dry, except from the 4th to the 6th, 15th to 18th, and 26th to 31st. The temperature was 2·9 degrees above the average, and 0·7 degrees below Manchester. Barometric pressure was above the average. Rain was phenomenally scanty, being only 1·75 inches, or 1·63 inches below the average. There was a thunderstorm on August 4th. Hours of bright sunshine were as many as 215, being 47 per cent. of possible duration, or 14 per cent. above the average. On the afternoon of August 11th, the barometer was broken during the painting of the Health Office. It was not returned from the makers until October 16th, when it was placed in the administrative block of the Infectious Diseases Hospital, and was first again used for observations on October 17th. In the meantime the cistern barometer on the North Pier was used, but this has no vernier and did not admit of being read to any greater nicety than 0·05 inches. On August 27th, the sunshine card was again stolen, so that none is recorded for that day.

September up to the 13th was fine, bright and warm. Afterwards it was very unsettled, accompanied by strong winds either from the S. W. or W. During a portion of the meeting of the Health Congress the wind was very violent, thus on September 22nd the velocity was 952 miles in 24 hours, on 23rd 1,145 miles, and again on

the 26th 976 miles. The mean temperature was 0·6 degrees above the average, 2·5 degrees above Stonyhurst, and 1·7 degrees above Manchester. Barometric pressure was low, with an extreme range of 2·4 inches. The rainfall was about the average, and fell on 20 days. The bright sunshine was 123·4 hours, being practically equal to the average.

October was a very fine and dry month, with excessive sunshine. On the 1st, 12th, and 29th of the month there were heavy falls of rain which accounted for nearly all the rainfall. Rain fell slightly on eight other days. Rainfall was 0·64 inches below the average. The temperature was equal to the average, being 1.1 degrees above Stonyhurst and 0·6 degrees above Manchester. There was slight frost on the nights of the 5th and 6th. Barometric pressure was high, with a rather large range. Bright sunshine amounted to 139·3 hours, being 43 per cent. of the possible duration and 16 per cent. above the average. On October 13th, the sunshine recorder was removed from the roof of one of the pavilions on the North Pier to a stage which had been erected in the grounds of the Infectious Diseases Hospital. This removal had become neeessary by the many occasions when the instrument had been tampered with or the card stolen. Its former situation could not be sufficiently protected, and was a constant attraction to the curious or mischievous section of the public. Endless annoyance, trouble and friction was caused by these occurrences, which will now cease, and I trust more regular and accurate records will now be kept.

November up to the 11th was wet and unsettled, with a gale from the S. W. on the 8th, velocity of wind being 1,031 miles, and one on the 10th from the south, having a velocity of 1,241 miles in the 24 hours. After that it was warm and dry, but with a deficiency of sunshine. The mean temperature was 5·7 degrees above the average, 1·8 degrees above Stonyhurst, and 1·9 degrees above Manchester. There was slight frost on the nights of the 17th and 18th. Barometric pressure was above the average, and the range was moderately large. Rainfall was 0·77 inches below the average. There were only 35 hours of bright sunshine as compared with an average of 43 hours.

December was dull, cold and changeable, with a heavy fall of snow, averaging at least 3½ inches in depth on December 11th, being very cold from then to the 17th. The mean temperature was 2·6 degrees below the average, but was 1·1 degrees above Stonyhurst and 0·8 degrees above Manchester. The lowest temperature recorded was 16 degrees of frost on the 14th. Barometric pressure was above the average, but the range was very great, amounting to 2.004 inches. Through a depression passing over us on the 29th the barometer fell to 28·52 inches. Rainfall was 0·32 inches below the average. Bright sunshine was only recorded for 15 hours, the average for the month being 25·4 hours. There were 15 frosty nights this month.

The highest temperature recorded in the shade was 84·5 degrees F. on August 24th, and the lowest 16 degrees F. on December 14th.

The wettest day was January 20th, when 1·05 inches of rain fell.

The driest day was May 31st, when the relative humidity was only 50.

There were four days when the air was completely saturated.

Appendix, Tables, &c.

TABLE A (Local Government Board Return).

TABLE OF DEATHS during the year 1899 in the Borough of Blackpool, classified according to Diseases, Ages and Localities.

Names of Localities.	Mortality from all causes at subjoined ages.								Mortality from subjoined causes, distinguishing Deaths of Children under 5 years of age.																					
	At all ages	Under 1 year	1 and under 5	5 and under 15	15 and under 25	25 and under 65	65 and upwards		Smallpox	Scarlatina	Diphtheria	Membranous Croup	Fevers.					Cholera	Erysipelas	Measles	Whooping Cough	Diarrhœa and Dysentery	Rheumatic Fever	Phthisis	Bronchitis, Pneumonia, and Pleurisy	Heart Disease		Injuries	All other Diseases	Total
													Typhus	Enteric or Typhoid	Continued	Relapsing	Puerperal													
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Claremont Ward	115	15	6	3	9	50	32	Under 5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	5	.....	.....	4	.....	.....	.....	9	21
								5 upwards	.....	1	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	1	3	10	14	12	.....	1	49	94
Talbot Ward (H)	214	76	29	6	12	56	35	Under 5	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	4	28	.....	.....	21	.....	.....	2	48	105
								5 upwards	.....	2	2	.....	.....	3	.....	.....	.....	.....	2	.....	.....	.....	.....	17	19	10	.....	3	51	109
Bank Hey Ward	40	6	3	2	5	19	5	Under 5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	2	.....	.....	.....	5	9
								5 upwards	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	3	.....	.....	23	31
Brunswick Ward	131	42	7	1	8	56	17	Under 5	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2	3	9	.....	1	11	.....	.....	.....	22	49
								5 upwards	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	1	14	11	16	.....	.....	38	82
Foxhall Ward	229	70	21	11	9	74	44	Under 5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	2	23	.....	1	14	.....	.....	.....	44	91
								5 upwards	.....	.....	.....	.....	.....	5	.....	.....	5	.....	.....	.....	.....	2	1	13	25	14	.....	5	68	138
Waterloo Ward	111	34	6	5	4	45	17	Under 5	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	10	1	.....	7	.....	.....	.....	17	40
								5 upwards	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	1	1	5	12	11	.....	2	35	71
Kirkham Workhouse (not in the Borough)	20	.....	.....	1	.....	13	6	Under 5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
								5 upwards	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	10	1	.....	.....	6	20
Other Institutions outside Blackpool	2	.....	.....	.....	.....	2	.....	Under 5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
								5 upwards	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2
Totals	862	243	72	29	47	315	156	Under 5	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	11	16	76	1	2	50	.....	.....	2	145	315
								5 upwards	.....	4	2	.....	.....	16	.....	.....	5	.....	2	.....	.....	5	6	64	93	67	.....	12	271	547

The subjoined numbers have also to be taken into account in judging of the above records of mortality.

Deaths occurring outside the district among persons belonging thereto in Kirkham Workhouse.	21	.....	.....	1	.....	14	6	Under 5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
								5 upwards	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	10	1	.....	1	7	21
Deaths occurring within the district among persons not belonging thereto.	150	15	11	9	11	72	32	Under 5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	3	9	.....	.....	1	.....	.....	.....	8	23
								5 upwards	.....	1	.....	.....	.....	4	.....	.....	.....	.....	1	.....	.....	1	2	11	20	17	.....	5	65	127

TABLE B (Local Government Board Return).

Table of Population, Births, and of New Cases of Infectious Sickness, coming to the knowledge of the Medical Officer of Health, during the year 1899, in the Borough of Blackpool, classified according to Diseases, Ages, and Localities.

Names of Localities.	Population at all ages. Census, 1891.	Population at all ages. Estimated to middle of 1899.	Registered Births.	Aged under 5 or over 5.	New Cases of Sickness in each Locality, coming to the knowledge of the Medical Officer of Health. Smallpox.	Scarlatina.	Diphtheria.	Membranous Croup.	Fevers. Typhus.	Fevers. Enteric or Typhoid.	Fevers. Continued.	Fevers. Relapsing.	Fevers. Puerperal.	Cholera.	Erysipelas.	Measles.	Rotheln.	Number of such Cases Removed from their Homes in the several Localities for Treatment in Isolation Hospital. Smallpox.	Scarlatina.	Diphtheria.	Membranous Croup.	Fevers. Typhus.	Fevers. Enteric or Typhoid.	Fevers. Continued.	Fevers. Relapsing.	Fevers. Puerperal.	Cholera.	Erysipelas.	Measles.	Rotheln.
a	*b*	*c*	*d*	*e*	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	7	8	9	10	11	12	13
Claremont Ward	3464	8104	188	Under 5	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
				5 upwards	.....	11	4	.....	.....	9	.....	.....	.....	.....	.....	11	.....	.....	8	2	.....	.....	4	.....	.....	.....	.....	.....	2	.....
Talbot Ward (H)	6300	10996	343	Under 5	.....	12	1	.....	.....	1	.....	.....	.....	.....	.....	55	.....	.....	11	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
				5 upwards	.....	43	2	.....	.....	10	.....	.....	.....	.....	.....	40	.....	.....	37	1	.....	.....	4	.....	.....	.....	.....	.....	.....	.....
Bank Hey Ward	2036	2126	24	Under 5	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
				5 upwards	.....	1	1	.....	.....	1	.....	.....	.....	.....	.....	4	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Brunswick Ward	4095	6744	174	Under 5	.....	4	1	.....	.....	.....	.....	.....	.....	.....	.....	29	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
				5 upwards	.....	14	1	.....	.....	8	.....	.....	.....	.....	.....	30	.....	.....	12	1	.....	.....	5	.....	.....	.....	.....	.....	1	.....
Foxhall Ward	4905	13432	379	Under 5	.....	13	.....	.....	.....	1	.....	.....	.....	.....	.....	114	.....	.....	11	.....	.....	.....	1	.....	.....	.....	.....	.....	5	.....
				5 upwards	.....	30	2	.....	.....	20	.....	.....	5	.....	.....	61	.....	.....	25	1	.....	.....	10	.....	.....	.....	.....	.....	2	.....
Waterloo Ward	2956	6798	190	Under 5	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	9	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
				5 upwards	.....	9	1	.....	.....	9	.....	.....	.....	.....	.....	5	.....	.....	8	.....	.....	.....	5	.....	.....	.....	.....	.....	1	.....
Kirkham Workhouse (not in the Borough)	.....	.....	11	Under 5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
				5 upwards	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	23846	48200	1318	Under 5	.....	33	4	.....	.....	2	.....	.....	.....	.....	.....	219	1	.....	28	1	.....	.....	2	.....	.....	.....	.....	.....	5	.....
				5 upwards	.....	108	9	.....	.....	57	.....	.....	5	.....	.....	151	.....	.....	91	5	.....	.....	29	.....	.....	.....	.....	.....	6	.....

Infectious Diseases Hospital situated in the Ward marked (H).

TABLE C.

POPULATION AND DEATH RATES (RESIDENTS) AT VARIOUS AGES.

	Blackpool, 1899.									Engl'nd and Wales 1881-90	Engl'nd and Wales 1881-90
	Per cent. of population living at various ages.		Number estimated living in 1899.		Total Deaths.		Death Rate.		Death Rates of persons at different ages.	Death Rates of males living at different ages.	Death Rates of females living at different ages.
	Males	Females	Males	Females	Males.	Females	Males.	Females			
Under 5 years ...	4·65	5·33	2,244	2,569	161	128	71·74	49·82	60·04	61·64	51·96
5 and under 15...	9·73	10·57	4,691	5,098	8	12	1·70	2·35	2·04	4·54	4·56
15 and under 25	7·57	11·59	3,648	5,589	11	25	3·01	4·47	3·89		
25 and under 65.	19·08	27·49	9,199	13,253	123	120	13·37	9·05	10·82	15·19	12·92
65 and under 75..	1·28	1·87	621	902	40	40	64·41	44·34	52·52	70·50	60·46
75 years and over	0·33	0·47	160	226	24	20	150	88·49	113·98	163·05	148·06

TABLE D.

ANALYSIS OF MORTALITY.

Average of	Birth Rate.	Annual Rate of Mortality from						Proportion of Deaths under 1 year to 1,000 births (Infant Mortality).	Percentage of Total Deaths					
		All Causes (gross D.R.)	All Causes (Corrected for Visitors.)	Seven principal Zymotics.	Pulmonary Consumption.	Other Diseases of the Lungs.	Heart Disease.		Of Infants under 1 year.	Under 5 years.	60 years and over	From seven principal Zymotics.	From Pulmonary Consumption.	From other Lung Diseases.	From Heart Disease
1881-85.	29·56	19·5	17·2	1·89	1·49	3·12	1·70	161	24·44	32·5	23·1	10·16	7·68	15·93	7·61
1886-90.	25·18	17·6	15·4	2·11	1·21	3·19	1·40	150	21·5	34·3	26·8	12·3	6·9	18·3	8·1
1891-95.	23·91	18·6	15·3	2·06	1·14	3·91	1·51	183·3	23·82	33·8	24·9	10·88	6·24	20·74	8·2
1891.	22·36	20·0	18·2	2·03	1·2	5·4	1·6	182	21·5	34·1	27·8	10·2	6·3	27·0	8·1
1892.	24·01	18·2	15·3	0·89	1·2	3·81	1·49	158	20·9	29·3	25·4	4·9	6·7	20·9	8·2
1893.	22·47	18·7	14·9	2·68	0·98	4·14	1·51	210·3	25·1	33·2	24·6	14·1	5·2	22·1	8·0
1894.	23·93	15·8	11·9	1·38	1·08	2·21	1·48	159·7	24·1	33·2	24·5	8·7	6·8	13·9	9·3
1895.	26·77	20·06	16·33	3·31	1·24	3·98	1·43	206	27·49	39·3	21·9	16·47	6·19	19·79	7·10
1896.	25·66	17·19	13·84	1·99	1·15	3·06	1·44	158·5	23·6	32·9	27·5	11·6	6·6	17·7	8·4
1897.	26·25	18·57	15·29	2·78	1·07	3·75	1·62	191·3	27·0	37·8	24·1	15·0	5·8	20·1	8·7
1898.	27·74	16·99	13·85	2·99	1·14	3·04	1·41	177·7	29·0	37·3	25·1	17·62	6·73	17·87	8·3
1899.	27·34	17·88	14·77	2·75	1·36	3·15	1·39	184·3	28·19	36·5	24·9	15·42	7·65	17·63	7·77

TABLE E.

Births and Deaths (Residents) in Each Quarter of the Year 1899.

Quarter ending	Births.	Deaths from all Causes.	Seven principal Zymotic Diseases.	Pulmonary Consumption.	Other Lung Diseases.	Heart Disease.	Total Deaths under 1.	Under 5.	65 years and over.
April 1st.....	311	194	18	16	48	16	37	51	43
July 1st	334	160	9	12	32	12	39	58	35
September 30th.....	358	175	49	13	22	8	87	100	22
December 31st	315	183	37	14	29	14	65	80	24
TOTALS.....	1318	712	113	55	131	50	228	289	124

TABLE F.

Shewing the Several Death Rates (Residents) for Each Quarter in the Year 1899.

Quarter ending	Death Rate.		Infant Mortality.	Per cent. of Total Deaths of Deaths.			
	From all Causes.	From 7 Zymotics.		From 7 Zymotics.	Of Infants under 1 year.	Of Children under 5 years.	Of Persons 65 years and over.
April 1st	16·15	1·49	118·9	9·27	19·07	26·26	22·16
July 1st.....	13·31	0·74	116·7	5·62	24·37	36·25	21·87
September 30th	14·56	4·07	243·0	28·0	49·71	57·14	12·57
December 31st	15·06	3·04	206·3	20·21	35·51	43·71	13·11

TABLE G.

Deaths	1892 Quarters. 1	2	3	4	Totals.	1893 Quarters. 1	2	3	4	Totals.	1894 Quarters. 1	2	3	4	Totals.	1895 Quarters. 1	2	3	4	Totals.	1896 Quarters. 1	2	3	4	Totals.	1897 Quarters. 1	2	3	4	Totals.	1898 Quarters. 1	2	3	4	Totals.	1899 Quarters. 1	2	3	4	Totals.
From all causes ...	123	110	131	124	488	116	115	173	128	532	103	124	132	122	481	156	165	179	161	661	133	141	170	177	630	162	179	214	191	746	142	186	225	219	772	214	198	239	211	862
Under 1 year	23	17	27	35	102	20	18	66	21	134	21	20	34	32	116	27	36	71	48	182	26	29	52	42	149	32	42	75	53	202	38	37	69	50	224	38	40	98	67	243
Under 5 years.....	31	24	41	47	143	42	26	79	30	177	29	41	43	47	160	46	59	89	66	260	35	47	66	59	207	47	67	94	74	282	44	48	109	87	288	52	65	115	83	315
60 years and over	33	38	22	37	130	27	29	35	40	131	26	30	33	29	118	47	40	26	32	145	45	33	51	44	173	51	42	43	44	180	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
From 7 Zymotics	2	1	11	10	24	10	7	49	9	75	6	6	20	10	42	12	14	58	25	109	11	12	33	17	73	8	20	56	19	112	5	9	77	45	136	20	13	60	40	133
„ Pulmonary Consumption	11	5	12	5	33	6	5	9	8	28	9	10	4	10	33	14	11	9	7	41	10	11	6	15	42	11	6	14	12	43	8	16	13	15	52	10	13	15	19	66
„ Other Lung Diseases	29	25	17	31	102	43	32	14	29	118	18	14	12	23	67	31	40	26	34	131	30	30	16	36	112	43	43	20	38	150	32	30	25	42	138	40	37	31	35	152
„ Heart Disease	10	7	17	6	40	6	19	10	8	43	10	13	13	9	45	12	13	9	13	47	9	14	18	12	53	15	16	16	18	65	12	21	14	17	64	18	19	13	17	67
„ 5 Zymotics ...	.....	.....	3	6	9	5	3	9	8	25	5	4	10	7	26	9	7	5	9	30	8	7	6	11	32	8	24	5	14	51	4	5	7	17	33	17	7	1	11	36
„ Diarrhœa	1	.....	8	1	10	1	1	38	1	41	.....	2	10	1	13	.....	2	51	16	69	2	1	25	5	33	.....	1	46	5	52	1	4	70	26	101	2	2	55	22	81
„ Whooping Cough	3	1	.....	3	5	4	3	2	.....	9	1	.....	.....	2	3	3	5	2	.....	10	1	4	2	1	8	.....	4	5	.....	9	.....	.....	.....	2	2	1	4	4	7	16

TABLE H.

Cases of Infectious Disease notified during the years 1890-1899 (inclusive).

Disease.	1890 Quarters. 1	2	3	4	Totals.	1891 Quarters. 1	2	3	4	Totals.	1892 Quarters. 1	2	3	4	Totals.	1893 Quarters. 1	2	3	4	Totals.	1894 Quarters. 1	2	3	4	Totals.	1895 Quarters. 1	2	3	4	Totals.	1896 Quarters. 1	2	3	4	Totals.	1897 Quarters. 1	2	3	4	Totals.	1898 Quarters. 1	2	3	4	Totals.	1899 Quarters. 1	2	3	4	Totals.
Rotheln	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	1	...	...	...	1
Smallpox	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	4	...	2	6	7	8	5	...	20	...	1	7	...	8	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....
Measles	125	28	17	3	173	10	25	73	138	246	11	6	20	11	48	4	25	88	5	122	2	102	205	11	320	28	20	50	10	108	29	96	19	3	147	198	447	106	43	794	51	43	21	144	259	154	70	53	93	370
Scarlet Fever	11	25	25	8	69	4	7	21	25	57	17	17	10	26	70	13	19	53	45	130	12	20	31	12	75	11	31	46	66	154	37	32	71	68	208	58	20	42	57	177	28	10	23	16	77	17	26	44	54	141
Diphtheria	7	4	4	1	16	4	4	...	1	9	3	2	3	3	11	2	1	6	3	12	5	1	4	1	11	3	6	4	4	17	2	2	2	...	6	2	2	...	3	7	4	2	4	...	10	4	1	4	4	13
Enteric Fever	2	3	18	9	32	10	3	7	10	30	6	4	12	14	36	9	3	15	15	42	5	1	11	43	60	24	13	14	28	79	10	3	13	40	66	11	6	15	18	50	18	6	26	17	67	21	12	13	13	59
Typhus Fever	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	...	.....	...	...	...	1	1	...	...	...	...	.....	...	...	...	.....
Puerperal Fever	...	1	1	2	4	...	...	...	...	.....	...	1	...	...	1	2	1	...	1	4	1	...	...	...	1	...	...	...	1	1	...	...	1	...	1	...	1	...	1	2	1	2	1	1	5	3	1	1	...	5
					294					342					166					316					487					367					428					1031					418					589

TABLE K.

	Population.	Rate per 1,000.				Total Births.	Total Deaths.	Infant Mortality per 1,000 Births
		Births.	Deaths.		Seven Zymotics.			
			Gross.	Corrected.				
1878...	13,000	38·8	21·0	...	5·0	439	274	166
1879...	15,000	36·6	17·8	...	3·06	401	268	122
1880...	15,000	34·0	22·7	...	5·0	510	341	205
1881...	14,229	30·6	18·6	15·8	1·2	436	265	126
1882...	16,000	30·0	22·9	21·0	2·8	480	367	220
1883...	16,000	30·0	19·5	16·6	1·6	480	312	139
1884...	17,212	29·8	19·0	17·1	2·14	513	328	146
1885...	18,031	27·4	17·2	15·2	1·71	494	311	174
1886 .	19,550	25·9	18·9	16·5	2·71	508	370	151
1887...	20,380	25·3	16·0	14·0	2·45	516	327	116
1888...	20,540	24·5	15·6	13·2	1·6	504	322	136
1889...	21,661	26·5	18·7	16·5	1·9	575	406	168
1890...	24,312	23·7	18·5	16·5	1·9	577	451	181
1891...	25,310	22·3	20·0	18·2	2·03	566	507	181
1892...	26,740	24·0	18·2	15·2	0·89	642	488	158
1893...	28,389	22·4	18·7	14·8	2·68	638	532	192
1894...	30,337	23·9	15·8	11·9	1·38	726	481	159
1895...	32,943	26·7	20·06	16·33	3·31	882	661	206
1896...	36,638	25·7	17·19	13·84	1·99	940	630	158
1897...	40,234	26·25	18·54	15·26	2·78	1,056	746	191
1898...	45,414	27 74	16·99	13·85	2·99	1,260	772	178
1899...	48,200	27·34	17·88	14·77	2·75	1·318	862	184

TABLE L.

SHEWING THE PERCENTAGE OF TOTAL DEATHS, OF DEATHS OF CHILDREN UNDER 5 YEARS OF AGE, AND OF PERSONS OVER 60 YEARS OF AGE.

	Total Deaths.	Under 5 Years of Age.	60 and over.	Per cent. of Total Deaths, of Deaths.	
				Under 5 years of Age.	60 and over.
1878	274	103	56	37·8	20·7
1879	268	93	50	34·7	18·6
1880	341	153	59	44·8	17·3
1881	265	80	61	30·1	23·0
1882	367	106	71	28·8	19·3
1883	312	106	76	33·3	24·3
1884	328	101	82	30·7	25·0
1885	311	123	74	39 5	23·7
1886	370	133	89	35·9	24·0
1887	327	107	99	33·0	30·0
1888	322	103	84	32·3	26·0
1889	406	147	93	36·2	22·9
1890	451	156	129	34·5	28·6
1891	507	173	141	34·1	27 8
1892	488	142	130	29·1	26·6
1893	532	177	131	33·2	24·6
1894	481	160	118	33·2	24·5
1895	661	260	145	39·3	21·9
1896	630	207	173	32·9	27·5
1897	746	282	180	37·8	24·1
1898	772	288	194	37·3	25·1
1899	862	315	215	36·5	24·9

METEOROLOGICAL OBSERVATIONS.

Lat.—53° 49′. Long.—5° 3′ W.

	1898.	1899.
Mean Temperature (of Max. and Min. combined)	50·0	49·25
Total Rainfall (in inches)	32·82	33·84

Bright Sunshine... 1898...1386...18 H. M.
1899...1481...74

1899. Month.	Pressure of Atmosphere in month corrected for temp. and press.		Temperature of Air in Month.									Mean Humidity Complete Saturation = 100.	Rainfall.				Bright Sunshine.	Amount of Cloud. 0=clear; 10=overcast 9 a.m.
			Means of				Absolute Extremes of						Amount (in inches).	No. of Rainy Days.	Maximum fall in one day.	Date.		
	Mean.	Range.	9 a.m.	All highest	All lowest	Daily Range.	Maximum.	Date.	Min.	Date.	Range.							
January	29·794	1·754	40·9	46·1	35·7	10·4	52·9	18th	22·3	28th	30·6	85·4	4·28	22	1·05	20th	38·7	4·2
February	29·831	1·781	40·5	47·3	33·7	13·6	57·0	9th	22·6	3rd	34·4	84·4	2·56	16	0·56	9th	77·57	4·5
March	30·590	1·636	41·6	48·2	35·0	13·2	57·3	17th	20·2	24th	37·1	86·1	2·19	17	0·92	25th	130·26	5·6
April	29·784	1·197	46·1	51·8	40·3	11·5	59·1	28th	30·3	23rd	28·8	81·7	3·93	22	0·73	24th	112·8	5·6
May	30·129	1·242	49·0	57·4	40·7	16·7	68.9	31st	30·5	5th	38·4	75·1	2·46	16	0·35	19th	171·1	3·7
June	30·069	1·260	59·0	68·1	50·0	18·1	76·5	17th	40·5	14th	36·0	70·7	2·07	9	0·57	30th	252·03	4·1
July	30·586	1·058	61·0	67·4	54·6	12·8	71·8	20th	48·9	9th	22·9	80·0	2·00	13	0·51	11th	171·56	6·5
August	30·177	0·520	62·3	71·0	53·7	17·3	84·5	24th	43·3	9th	41·2	74·6	1·75	11	0·42	31st	215·03	3·6
September	29·843	2·4	55·9	61·6	50·2	11·4	75·2	4th	36·0	28th	39·2	75·9	3·57	20	0·87	21st	123·41	6·0
October	30·099	·927	48·9	56·9	41·0	15 9	65·4	17th	31·3	6th	34·1	81·6	3·55	11	1·02	29th	139·34	3·6
November	29·812	1·621	48·8	53·1	44·6	8·5	62·3	2nd	30·5	18th	31·8	86·8	2·64	13	0·84	4th	34·96	6·8
December	29·955	2·004	36·3	41·5	31·2	10·3	53·0	5th	16·3	14th	36·7	86·5	2·84	15	0·37	4th	15·01	7·0

Direction of Wind at Blackpool during 1899.

1899.	N.	N.N.E.	N.E.	E.N.E.	E.	E.S.E.	S.E.	S.S.E.	S.	S.S.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.	No of Days in each Month
January.....	2	..	6	..	2	...	7	...	...	...	4	1	4	...	5	..	31
February	2	..	1	...	6	6	8	..	3	...	2	..	...	..	..	..	28
March	2	..	2	..	3	..	4	..	2	..	4	2	7	...	5	..	31
April	4	2	5	...	..	..	2	...	1	..	3	2	7	...	4	...	30
May	1	..	10	...	4	1	9	..	..	..	2	3	1	...	..	..	31
June	...	..	..	2	6	3	5	..	..	1	2	..	5	1	5	..	30
July	1	..	..	1	4	..	3	..	..	..	1	7	10	...	4	..	31
August	..	..	5	2	6	5	5	..	1	...	1	1	3	1	1	..	31
September ...	3	..	2	..	1	1	...	..	2	..	4	3	9	1	4	..	30
October.....	..	...	..	..	5	9	1	...	1	1	...	4	6	1	3	..	31
November.....	..	..	1	1	1	4	2	..	2	..	3	5	6	1	4	..	30
December	..	..	8	1	5	...	9	..	...	..	1	..	1	..	6	..	31
Totals	15	2	40	7	43	29	55	...	12	2	27	28	59	5	41	...	365

REPORT

ON

ENTERIC FEVER

AND

DIARRHŒA

IN THE BOROUGH OF BLACKPOOL, DURING THE YEARS

1898 AND 1899.

BY

A. Jasper Anderson, M.A., M.B., Oxon., D.P.H., Cantab,

MEDICAL OFFICER OF HEALTH.

ORDERED TO BE PRINTED BY THE SANITARY COMMITTEE

Blackpool:

PRINTED BY HARGREAVES & WILSON, EUSTON STREET

1900.

SPECIAL REPORT

ON THE

Prevalence of Enteric Fever and Diarrhœa

IN THE

BOROUGH OF BLACKPOOL.

In obedience to the request of the Local Government Board and also of the Council of the Borough of Blackpool, I have drawn up the following report on the distribution, and ascertainable causes, of these two diseases, enteric fever and diarrhœa, and the measures used to prevent their spread and occurrence. This report relates more especially to the two years 1898 and 1899, but I have not hesitated to go into the statistics of the diseases for former years in the hope of elucidating the causes, and thus improving our methods of prevention. A very difficult study has been thrust upon me, and herein I have made an honest attempt as far as my abilities will allow me, to get at the root of the matter.

I intend to divide the Report into four parts:—part 1 dealing with enteric fever, part 2 with diarrhœa, part 3, with features common to the two, and part 4 with suggestions for the future.

PART I.—ENTERIC FEVER.

History of the Disease.

Enteric Fever has been notifiable under the Blackpool Improvement Act, 1879, since that date, and the following table will be useful as showing how many known cases and deaths have occurred therefrom since then.

	1880	1881	1882	1883	1884	1885	1886
Population ..	14,000	14,414	15,178	15,982	16,829	17,721	18,660
Cases	43	16	41	23	26	22	18
Deaths	9	3	7	5	5	3	6

	1887	1888	1889	1890	1891	1892	1893
Population ..	19,648	20,689	21,786	22,940	25,310	26,740	28,389
Cases	17	56	39	32	30	36	42
Deaths	4	7	8	3	4	4	5

	1894	1895	1896	1897	1898	1899
Population ..	30,337	32,943	36,638	40,234	45,414	48,200
Cases	60	79	66	50	67	59
Deaths ..	8	12	13	15	16	16

The populations from 1881 to 1890 have been re-calculated on the supposition that the rate of increase from April, 1881 (Census 14,229), to April, 1891 (Census 23,846), was uniform.

From this it will be seen that enteric fever has always been present to some extent, but seemed to get to the very lowest ebb in the years 1890—1893, and to have gradually risen since until it attained its maximum in 1898.

Reading through the reports of my predecessor I find that from 1881 to 1890 cases of the disease were spread over each quarter of the year as a rule, although in 1888 the incidence of the

disease was in the third and fourth quarters, especially the fourth. This was succeeded by a special incidence of the disease in the first quarter of 1889. Of the 290 cases notified in these ten years, 57 occurred in the first, 39 in the second, 94 in the third, and 100 in the fourth quarter. These cases were not traced to the public water supply in any instance, and only at the beginning of the period in a few instances to water supplied from polluted wells. The milk supply was likewise never found responsible. The causes of the disease were put down as privies and open ashpits in the earlier years, and after these had been to a great extent abolished, to emanations from defectively laid, flushed, and ventilated sewers. The disease was specially prevalent in the neighbourhood of Lark Hill and Buchanan Street, i.e., the terminus of the *inland main sewer*, and this sewer, which was to a great extent unventilated in its lengthened course to the sewer chamber, was to a large extent held responsible for the distribution of the disease.

In 1889 a house-to-house inspection of drains by the smoke test was instituted, and has been going on since. If anything ought to have prevented the occurrence of enteric fever and its spread this ought to have done so, but it does not appear to have had any very marked beneficial effect. In the earlier years the repairs done as a consequence of this test were carried out in a very jerry manner, and although at present they are not done to my complete satisfaction, there is no doubt that the work is immensely superior and likely to be more durable. I am preparing a special report shewing the state of the drains at all houses tested in 1899, and making a comparison with work previously done there.

The continued prevalence of the disease since 1894 points in my mind to some cause of the disease other than defective drains. For no matter how badly the drains have been repaired in Blackpool they must be incomparably better than those in many other towns where the drains have not been investigated for years, and where enteric fever is not so rife.

I now propose to consider in more detail the history of the disease since 1890, during which period I have been Medical Officer of Health.

In 1891 there was a decrease of the number of cases notified and towards the end of the year I instituted the system of collecting the excreta from all known cases of enteric fever in pails charged with sawdust impregnated with carbolic acid, with subsequent cremation of the contents, and having the drains of the house disinfected at once by a solution of carbolic acid, 1 in 50, and if the case remained at home, disinfecting the drains a second time by the same method at the conclusion of the case. After a time I gave instructions for the drains to be blocked at the disconnecting trap, filled with disinfectant, and allowed to remain so for half-an-hour. Of the thirty cases, five were ill on arrival in the town, and one of them died.

In 1892 there was evidence that four of the cases were due to emanations from the open trenches of sewers or drains.

The cases in 1893 were practically limited to the third quarter of the year. Of the 42 cases, eight were imported. There was evidence of the spread of the infection from the patient to those tending him in two instances. Cases occurred along the course of the Bonny Street sewer, and at the terminal portions of the inland main sewer about Larkhill region.

In 1894 the 60 cases practically began to be notified in the 36th week of the year, and continued until the end. Two cases occurred in a house where there was a leaky branch sewer, from which sewer gas could pass into the lower rooms. Into the main sewer to which this was attached hot waste water from a boiler passed. A third case occurred in the same house in 1895.

In 1895 the epidemic continued throughout January, February, and March, until only one case was notified in April. In May a fresh outbreak occurred of ten cases, due to milk being

supplied by a farmer outside the borough, where the wife of one of the sons was dying from enteric fever, and the son was recovering from it without the nature of the disease having been recognised. The water supply to the cottage was a surface well in the middle of the road. There was no doubt this had become polluted, and had thus infected the milk. Cases afterwards occurred with gradually increasing frequency until December. In one case which occurred in a new house without any serious sanitary defect, the patient obstinately refused to be removed to hospital. Three of her children subsequently developed the disease, one of whom died. In another instance a woman contracted the disease and her husband and landlady, who nursed her previous to removal to hospital, became infected. This was also a new house. There were several other instances of infection directly from person to person.

In 1896 cases occurred in the first quarter as remnants I suspect of the cases in the fourth quarter of 1895. After the 36th week of the year the cases began to be notified with something like the usual frequency. In October there was a smart epidemic of the disease, which I traced to the consumption of raw mussels taken from the jetty of the Central Pier. In my annual report I gave the evidence on which I based my conclusions, and in my opinion it is the strongest evidence that can ever be obtained in tracing infection in this disease, and especially from any particular article of diet. I set about my investigations without any idea of the kind in my mind, and it was gradually forced upon me during the inquiries made in the course of the epidemic. The public were warned against this danger, and since then I have employed men to clean the mussels off both the Central and North Pier jetties and have kept them clear of any sufficiently large to eat.

Again, in 1897, the disease was carried on into the 3rd quarter by dropping cases through the 1st and 2nd, and to become more prevalent during the 4th quarter. The notified cases were only 50, *i.e.*, fewer than in 1896, but the deaths were more, viz., 15

Two cases occurred in an hotel, where a cesspool and bad drain were discovered through an examination made because of an imported case being notified there. That is, in this instance the introduction of the infection was required before the emanations of the leaky drains, &c., gave rise to the disease.

Five cases were notified in the district of Springfield, where the outlet for sewage beneath the railway is not sufficiently low to permit of the sewers running free.

Cases Notified in 1898 and 1899.

In 1898 there were 67 cases and 16 deaths. There was no evidence that any of these cases were due either to the water supply or the milk supplies.

In the first quarter there were 18 cases, in the second 6, in the third 26, and in the fourth 17.

In 1899 there were 59 cases and 16 deaths. The cases were distributed thus: 21 in the first, 12 in the second, and 13 each in the third and fourth quarters.

It is thus obvious that the causes which were at work in the third and fourth quarters of 1898 had not exhausted themselves in the first quarter of 1899, but it is worthy of notice that there was not the usual increase of cases in the third and fourth quarters of 1899.

The prevalence of the disease hence appears to be due not to any epidemic influence, but to its having become endemic.

Age and Sex Distribution of the Cases.

I have arranged all the cases notified since 1891 into certain age-groups for each sex, adding them all together for the years 1891—97, so as to compare with the similar figures for 1898 and 1899.

Cases of and Deaths from Enteric Fever in the years 1891 to 1897, classified into sexes and various age-groups.

Age-Group.	Under 5 years.		Over 5 and under 10 years.		Over 10 and under 15 years.		Over 15 and under 20 years.		Over 20 and under 25 years.		Total Carried forward.	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases.	Deaths
Males.	8	—	27	2	36	3	28	1	28	6	127	12
Females.	8	3	16	1	29	3	14	1	24	4	91	12
Persons.	16	3	43	3	65	6	42	2	52	10	218	24

Age-Group.	Total B'ght forward		Over 25 and under 30 years.		Over 30 and under 65 years.		Over 65 years.		Unknown.		Total.	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Age	Sex	Cases	Deaths
Males.	127	12	17	6	64	15	—	—	1		209	33
										1	1	
Females.	91	12	24	3	36	12	1	1	1		153	28
Persons.	218	24	41	9	100	27	1	1	2	1	363	61

Cases of and Deaths from Enteric Fever in the years 1898 and 1899, classified into sexes and various age-groups.

Age-Group.		Under 5 years.		Over 5 and under 10 years.		Over 10 and under 15 years.		Over 15 and under 20 years.		Over 20 and under 25 years.		Total carried forward	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Males ...	Year 1898	1	...	3	...	3	...	5	2	7	1	19	3
	Year 1899	2	...	3	...	2	2	3	...	6	2	16	4
Females.	Year 1898	1	...	6	2	1	...	4	...	5	3	17	5
	Year 1899	...	...	4	...	3	...	5	3	5	1	17	4
Persons..	Years 1898 & 1899	4	...	16	2	9	2	17	5	23	7	69	16

Age-Group.		Total B'ght forward		Over 25 and under 30 years.		Over 30 and under 65 years.		Over 65 years.		Totals.	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Males	Year 1898	19	3	7	1	10	2	1	1	37	7
	Year 1899	16	4	6	2	13	3	...	...	35	9
Females ...	Year 1898	17	5	5	2	7	1	1	1	30	9
	Year 1899	17	4	1	1	6	2	...	...	24	7
Persons ...	Years 1898 and 1899	69	16	19	6	36	8	2	2	126	32

At all these ages the female population exceeds the male, and hence it is obvious that at all ages the male sex is more prone to be attacked with the disease.

On the other hand, for the years 1891—97 the mortality per 100 cases was 15·8 for males, and 18·3 for females, and for the years 1898 to 1899 it was 22·2 for males and 29·6 for females. We may, therefore, safely conclude that there is a greater chance of recovery in a male than a female subject of the disease.

Both males and females aged from 15 to 30 years are the most subject to attack, although there is a fair incidence of the disease on these at ages even down to five years, and upwards to forty years.

The disease appears to become more fatal with the increasing age of the patient, until all cases over 65 years of age die.

Distribution of the Disease.

I have distributed the cases into their wards for 1898 and 1899, and along with the population for each year, and for comparison have given the total cases in the wards from 1891 to 1897.

	Claremont Ward.	Talbot Ward.	Bank Hey Ward.	Brunswick Ward.	Foxhall Ward	Wat'rloo Ward.	Total.
1898.	5	21	3	15	10	13	67
Population, 1898.	7572	10527	2136	6413	12489	6277	45414
1899.	9	11	1	8	21	9	59
Population, 1899.	8104	10996	2126	6744	13432	6798	48200
1891 to 1897.	35	94	26	87	83	38	363

For the two years 1898 and 1899 the order of frequency in the wards, placing the worst first, is Brunswick, Waterloo, Talbot, Foxhall, Bank Hey, and Claremont: whilst for the years 1891 to 1897 the order is Brunswick, Bank Hey, Talbot, Foxhall, Waterloo and Claremont.

On the spot maps for the years 1898 and 1899 it is seen that the reason of this position of Brunswick Ward at the head of the list is due to the occurrence of cases in Coop Street, Caroline Street, Victor Street, Railway Street and Kay Street, *i.e.*, in the proximity of the sewage chambers, and in low-lying positions of the ward where sewage is liable to flood the basements of the houses when there is a heavy rainfall, and especially if it coincide with the tide at flood.

The cases in Talbot Ward were distributed to some extent in blocks, thus, Police Street, Exmouth Place, and Edward Street, where there was a defective sewer; New Road, Whiteside Street, Back Eden Street, George Street, Buchanan Street, and Elizabeth Street, one of the terminations of the inland main sewer and at its highest point; Caunce Street (four cases), Moister Road, Charles Street, Gorton Street, Durham Road, Oxford Road, and Peter Street, which drain into the same chief tributary of the inland main sewer as the streets just mentioned. The gradients in the chief sewer here are above the average, and to a great extent the manholes have open surface gratings which have not been purposely closed, but the interstices of the grids are not kept free from dirt. There is a high 6in. ventilator at the upper part at the back of Seed Street.

It is noteworthy that no case of enteric fever occurred in Greenhill which is another termination of this sewerage system, but which is entirely unventilated.

Revoe was largely responsible for the cases in Foxhall Ward; thus, there were five in Belmont Avenue, and others in Ribble Road and Brown Street, these being situated in the terminal ends of branch sewers delivering into the inland main sewer.

Another collection of three cases occurred in St. Helier's Road, which is low-lying and on boggy ground, and only recently has the sewage been taken therefrom into the new Middle Lane sewerage system, which empties into a tank near the Destructor, whence it is pumped into the sea.

There were a group of four cases in the Lytham Road sewer, near the Bridge house, viz., at Pleasant Grove, Woodfield Road, and Lytham Road itself. Two cases occurred in Wood Street, which at that time drained into a cesspool, with pail closets for the collection of excreta.

The cases in Waterloo Ward were grouped as follows:— (i.) Abbey Road and Ash Street, where the sewers are defective, at a very small gradient, and at the end of the new sewerage system; (ii.) three cases at Stoneycroft and one at Stoneyhill, which is near the terminus of the defective Lytham Road sewer; (iii.) a group of four cases in Withnell and Balmoral Roads. The gradients of the sewers in these roads are very slight, and as a rule they are half filled with sand, with the consequence that the sewage of this district is being treated in an elongated cesspool, anaevobically combined with sand filtration. At spasmodic intervals these sewers are dredged, and the filthy contents removed, but a complaint or case of illness is required to bring this about. (iv.) Cases at Hawes Side and Brook Street, where cesspools existed and as yet the drains were not attached to the sewers; and (v.) two cases in connection with the Gipsies' encampment.

In Claremont Ward the cases were in Carshalton, Cheltenham, Clifford, Chesterfield, Ashburton, and Egerton Roads, which are sewered into the Gynn outfall in some instances, but as yet this system is not complete. Other cases were in Lewtas Street and Cross Street, at the terminus of the general sewerage system of the town.

Method of Procedure.

I fear that because of the difficulties of diagnosis many mild cases escape detection, and therefore no measures of prevention are

taken, and hence, in spite of the care taken with regard to known cases, the drains and sewers become infected with the typhoid bacillus.

Again, cases are often watched a considerable time before a diagnosis is arrived at, and hence before a notification is sent infection is being spread. The offer to apply Widal's test to the blood serum free of charge, and the supply of an outfit to any medical man of the town, is of considerable value, and was to a great extent used during the year 1899. As a matter of practice, I found that it often failed until the case was well in the second week.

There are very great difficulties experienced in enquiring into cases of this disease, because of the clouded state of the intellect of the patient, and even the patient being too ill to be troubled with such matters when the certificate of notification is sent.

The disease has a very gradual onset, and, as a rule, one cannot say definitely when a particular case commenced, but from the symptoms noticed I should say that on an average a certificate is sent at the end of the second week.

As soon as a certificate arrives an inquiry is made on a form of which the following is a copy :—

ENTERIC FEVER.

Name.....Age.....

Address.....Visitor.....Resident.

If Visitor, home address and date of arrival.....

How long in House.....

Size of House.....Rent.....

Medical Attendant ..... First called in .....

Notified.....o'clock on the 189

How Isolated .....

Nursed by.....

Other Duties of Nurse .....

Removal to Sanatorium ..... No....Yes.... at .....o'clock

Water Supply ....

Milk Supply.....

Bedding requiring removal .....

.....

.....

Age. M.	Age. F.	Name.	Occupation and Place of Work, or School.	History.	Last at Work, or School.

Laundress .....

Borrower from Free Library.....Book borrowed at present.....

Recent illness in family, relatives, or neighbours .....

.....

Has patient visited any infected house within three months ?.....

If so, where and when ? .....

Has any person visited within three months from an infected house ? .....

Name, Address, and Date.....

Has any article been brought from an infected house ?.....

Name, Address, and Date .....

Sanitary Defects .....

Has patient had the disease before ? .....

Has patient eaten raw oysters, mussels, or other shell fish, within a month ?

Has patient eaten watercress lately ? .....

Does patient drink milk without being boiled, when well ? .....

Is there any evidence of the disease having been communicated by other articles of food, as ice cream, &c. ?.....

REMARKS :—

Dated.....o'clock this.....day of.....189

Signed.....Inspector.

The filled up inquiry form is returned to the office, and the two following notices are posted to the householder:—

BOROUGH OF BLACKPOOL.

DANGEROUS INFECTIOUS DISORDERS.

To..... .....

It having come to the knowledge of the Mayor Aldermen and Burgesses of the Borough of Blackpool that a dangerous infectious disorder, viz., Enteric fever, exists in your house, YOU are hereby required to take notice of the provisions of the Public Health Act, 1875, and the Infectious Disease (Prevention) Act, 1890, so far as they relate to the prevention of the spread of Infectious disorders and the means to be adopted for that object:—

1.—The Town Clerk may give notice to the owner or occupier of any house or part of a house that the same and any articles therein will be cleansed and disinfected by the Corporation at the cost of such owner or occupier unless he informs the Corporation within twenty-four hours of the receipt of the notice that he will cleanse and disinfect the house or part thereof and any articles therein to the satisfaction of the Medical Officer of Health, within a time fixed in the notice.

In default, the officers of the Corporation shall cleanse and disinfect the same and the expenses may be recovered from the owner or occupier in a summary manner.

Provided that where the owner or occupier of any such house or part thereof is unable in the opinion of the Corporation, or *of their Medical Officer of Health*, effectually to cleanse and disinfect such house or part thereof, and any article therein likely to retain infection, the same may without any such notice being given as aforesaid, but with the consent of such owner or occupier, be cleansed and disinfected by the officers of and at the cost of the Corporation.

[NOTE.—This section refers to the measure of disinfection required to be done when the case of infectious disease has recovered so far as to be no longer infectious, or when the case has been removed to other premises for the purpose of isolation.]

2.—The Corporation or the Medical Officer of Health may require the owner of any bedding or clothing, or other articles which have been exposed to the infection of any infectious disease to deliver the same to an officer of the Corporation for the purpose of disinfection, and any person who fails to comply shall be liable to a penalty not exceeding TEN POUNDS. The bedding, clothing, and articles shall be disinfected by the Corporation and shall be brought back and delivered to the owner free of charge.

3.—The Corporation may direct the destruction of any bedding, clothing, or other articles which have been exposed to infection from any dangerous infectious disorder, and may give compensation for the same. (Section 121.)

4.—Any person who—

(1) While suffering from any dangerous infectious disorder, wilfully exposes himself without proper precautions against spreading the said disorder in any street, public place, shop, inn, or public conveyance, or enters any public conveyance without previously notifying to the owner, conductor, or driver thereof that he is so suffering; or

(2) Being in charge of any person so suffering, so exposes such sufferer; or,

(3) Gives, lends, sells, transmits, or exposes, without previous disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any such disorder;

will be liable to a penalty of FIVE POUNDS, and also to pay the expenses of disinfection of the conveyance. Provided that no

proceedings under this section may be taken against any person transmitting *with proper precautions* any bedding, clothing, bags, or other things for the purpose of disinfection. (Section 126.)

Parents and Guardians are especially cautioned against sending any child suffering from any infectious disorder, more particularly Small Pox, Scarlet Fever, or Measles, to school or into any street or public place before complete recovery (a period of at least six weeks in the case of Small Pox or Scarlet Fever), or where there is any such disorder in the house of such parent or guardian ; neglect of this precaution leads to the rapid spread of these dangerous disorders, and renders the Parent or Guardians of the child so exposed liable to the penalty above mentioned.

5.—Any person who knowingly lets for hire any house, room, or part of a house in which any person has been suffering from any dangerous infectious disorder without the same and all articles therein liable to retain infection, having been disinfected to the satisfaction of a legally qualified medical practitioner, as testified by a certificate signed by him, will be liable to a penalty of TWENTY POUNDS. (Section 128.) An inn is included in this section.

And any person in letting, or shewing for the purpose of letting for hire, any such house, or part thereof, and knowingly making a false answer to any question as to the existence then, or within six weeks previously, of any dangerous infectious disorder in such house, or part thereof, will be liable to a penalty of TWENTY POUNDS, or to *imprisonment*, with or without hard labour, for ONE MONTH. (Section 129.)

Every person ceasing to occupy a house or part of a house in which any person has within six weeks been suffering from any infectious disease, who, on being questioned by the owner thereof, or by any person negotiating for the hire of such house or part of a house as to the existence within six weeks previously of any infectious disease, knowingly makes a false answer shall be liable

to a penalty of TEN POUNDS. (Section 7, Infectious Disease [Prevention] Act.)

6.—No owner or driver of a public conveyance shall be required to convey any person suffering from any dangerous infectious disorder, until he has been paid a sufficient sum to cover the loss or expense of disinfecting his conveyance. (Sec. 127.)

7.—No person without the sanction in writing of the Medical Officer of Health or of a Registered Medical Practitioner. shall retain unburied elsewhere than in a Public Mortuary or in a room not used as a dwelling-place, sleeping-place, or work-room, for more than forty-eight hours the body of any person who has died of any infectious disease.

8.—Any person who hires or uses a public conveyance other than a hearse for the conveyance of the body of a person who has died from any infectious disease without previously notifying him that the person whose body is to be conveyed died from infectious disease, and that after any such notification any owner or driver of a public conveyance other than a hearse which has conveyed the body of a person who has died from infectious disease, who shall not immediately afterwards provide for the disinfection of such conveyance shall be guilty of an offence.

9.—Any person who shall knowingly cast into any ashpit, ashtub, or other receptacle for refuse matter, any infectious rubbish without previous disinfection, shall be guilty of an offence. (Sec. 13. Infectious Disease [Prevention] Act.)

You are especially cautioned against sending any clothing or infected article to any laundry or place *used by others*, or out of your house. Infected articles will be removed by the officers of the Corporation to the disinfecting station for the purpose of disinfection.

The Corporation believe that during the prevalence of nfectious disease many cases of violation of the law and consequent

danger to public health arise from ignorance and want of forethought; to prevent neglect from this cause the Corporation thus specially call your attention to the above provisions of the law, although such notice is not necessary, nor will the absence of it afford any excuse in the event of any offence being committed.

In the interests of the public health, and in the discharge of the responsibilities imposed upon them by the Legislature, the Corporation will feel it their duty to enforce the penalties imposed by the Statute against all who may violate its provisions.

The Corporation rely on your cordial co-operation and assistance in, so far as possible, preventing the spread of this dangerous malady.

T. LOFTOS, Town Clerk.

Town Hall, Blackpool,
March 31st, 1897.

Borough of Blackpool.

Precautions to be adopted on the Outbreak of Infectious Disease in a House or Building used for the purpose of Habitation.

By Section 87 of the Blackpool Improvement Act, 1893, a person suffering from a dangerously infectious disease can be compulsorily removed to the infectious diseases hospital, unless proper isolation can be provided at home.

A—*Precautions to be adopted when the Patient remains at Home.*

The patient must be removed to a bedroom in the upper storey of the house, if possible one with a fireplace, and in case of a house having a w.c. inside and bathroom, within easy reach thereof. Across the passage leading to the suite of rooms intended for the occupation of the patient and nurse, there must be hung a sheet dipped in carbolic acid solution, of the strength of one part of strong acid to fifty of water. The w.c. and bathroom are not to be used by anyone except the patient and nurse. The passage should, as far as possible, be kept well ventilated.

All needless articles, such as carpets, heavy curtains, contents of wardrobes and of drawers, &c., should be removed from the rooms intended to be used by the patient.

The bedroom and its contents from which the patient has been removed will be required to be disinfected.

At the entrance to the passage a table should be placed, so that all articles of food for the patient's use can be deposited thereon, as also a wash-hand basin, with soap and disinfectants, so that the medical attendant and nurse can wash their hands and face on leaving the infected area.

A non-infected dress should hang thereabouts for the nurse to put on in place of her ordinary dress when she requires to leave the suite of rooms for outdoor exercise and other purposes, and a wrapper for the medical attendant to use on his visits.

Motions should be received in a utensil containing some strong carbolic acid or other recognised disinfectant.

The discharges from the patient's mouth and nose should be received into pieces of soft rag and burnt.

No utensil should be removed from the room unless it has been well rinsed in disinfecting solution.

Food left over by patient should not be eaten by anyone except the patient.

Dirty clothes should be placed in a solution of carbolic acid (1 in 50), and after lying there for 24 hours should be removed downstairs to be washed and boiled separately.

Letters should not be written in the sick room; books, papers, and toys which have been in the sick room should be burnt, unless they have been thoroughly disinfected at the end of the case.

None shall enter the patient's apartments except the doctor and the nurse.

The patient will be required to be kept in these apartments until all risk of infection has ceased.

In the case of *Scarlet Fever* (Scarlatina is only another name for the disease) infection lasts as long as there is any peeling of the skin. The last places to peel are the scalp, palms of the hands, soles of the feet, and backs of the arms. The usual duration of infection in this disease is rarely less than six weeks.

In *Diphtheria* special care requires to be taken to disinfect or destroy anything which has touched the patient's lips or interior of the throat. Infection continues for several days (in some cases,

weeks) after the total disappearance of the membrane from the throat.

In *Measles* the infection lasts as long as the fine peeling of the skin, often noticed in this disease. Usually there is very little danger of infection after a fortnight has elapsed from the onset of the rash.

In *Enteric Fever* or *Typhoid Fever* the nurse is required to place all stools or urine into the special tubs charged with disinfectants, which will be provided by the Corporation, and renewed daily or every other day, as the occasion requires. The duration of the disease is very variable.

When the patient is considered to be free from the infection of any of the above diseases, a warm bath should be given, some disinfectant soap being used, and he should be clothed in a set of clean underclothes and non-infected upper garments. He is then to leave the infected apartments, which are to be kept closed until the disinfector employed by the Corporation comes to disinfect the room or rooms. Word should be sent to the Public Health Office, 49, Abingdon Street, when a house is ready to be disinfected.

During the period of illness no child will be allowed to attend school from the house, and no books to be borrowed from the Free Libraries or other Libraries.

None of the household should attend Church, Chapel, or any Public Meeting. No one from the house should go into a neighbour's, nor should a neighbour be admitted into the house.

Disinfection will be done free of charge, and disinfectants supplied free of charge at the Health Office.

B –*Precautions to be adopted when the Patient is removed to Hospital.*

The Inspector will arrange the time and method of removal. A nurse will be sent in the ambulance for the patient if it be considered requisite.

After the patient has been removed, the person who has been in attendance upon him or her, must leave his or her garments in the infected room, putting on in their place others which are non-infected.

The room must be locked up until the process of disinfection adopted by the Corporation Officials is begun.

When the patient is well enough to be dressed in his or her clothes, a set of every-day clothes should be chosen which, together with a complete change of underlinen, should be sent with him or her to the hospital.

Each patient should have at least three night-dresses or shirts.

The nurse should be given all medicines, &c., ordered by he medical attendant, and told carefully the instructions as to treatment and diet left by him.

The Corporation cannot undertake to send for medicines for patients in the hospital.

A child must not attend school from the house until 7 days have elapsed from the date of disinfection in the case of scarlet fever, enteric fever, and diphtheria ; and 14 days after measles.

Visiting Patients.—The hours of visiting are 2 to 3 p.m. every Tuesday, Thursday, and Sunday. Visitors are only allowed to communicate with patients through the closed windows, and only two persons are allowed to visit each patient at the same time. There is a great risk in bringing children as visitors, as they are very subject to catch any chance infection.

No visitor is to give any article of food or drink to a patient, but visitors may hand over any article of food to the Matron, who will give it to the patient for whom it is intended, provided the medical attendant thinks it wholesome.

In the interests of the patients themselves, it is undesirable that friends of patients should personally make inquiries at the hospital, or visit it at irregular times Information can be obtained daily by telephone at the Public Health Office, 49, Abingdon Street, between 9 a.m. and 1 p.m., and 2-15 p.m. and 5 p.m.

If a patient is dangerously ill on admission, or becomes so afterwards, information will be sent forthwith to the nearest known relative or friend.

A. JASPER ANDERSON, M.A., M.B., Oxon,
D.P.H., Cantab.
MEDICAL OFFICER OF HEALTH.

Public Health Office,
49, Abingdon St., Blackpool,
August, 1894.

A notice of which the following is a copy is sent to the Librarian, and also a weekly list.

PRIVATE.—Not for Publication.

PUBLIC HEALTH OFFICE,.....189.

Notice to the Librarian, of the Houses, with the Names of their Occupiers, in which Infectious Disease exists.

I hereby give you Notice that Infectious Disease exists in the House mentioned below. I request you to forward me immediately, WITH ALL PROPER PRECAUTIONS, any Book which may be returned by a Borrower inhabiting the house after this date and until the house is struck off the Weekly List. During the same time Books should not be lent out to any such readers. After disinfection the Books will be returned to you.

NAME.	ADDRESS.	NAME.	ADDRESS.

.....

To the Librarian. *Medical Officer of Health.*

If any children in the house are attending any school, whether public or private, a notice is sent to the Schoolmaster on the following form.

PRIVATE,—For Reference only.

BOROUGH OF BLACKPOOL.

EDUCATION CODE, 1886. Art 98.

PUBLIC HEALTH OFFICE,.....189

Notice to the Managers of Schools or the Schoolmaster or Schoolmistress of the existence of Infectious Disease.

Name.....

The following Infectious Disease, viz.; .....

exists in the House situate at .....

occupied by .....

Members of whose family are said to attend your School.

NOTE.—It is desirable, for the purpose of preventing the spread of the disease above referred to, that no person from the house above-mentioned should attend School until all danger of infection be passed. Where SCARLET FEVER or SMALL POX exists in any family, no Child should attend School from the House for a period of at least six or eight weeks *after the occurrence of the last case.* In the case of DIPHTHERIA, the period should not be less than five weeks; in MEASLES, three weeks; and in ENTERIC (TYPHOID) FEVER, four weeks. By the diligent exclusion from School of children coming from infected houses, or being themselves not free from infection, much may be done to prevent the spread of the disease. In the event of any difficulty the Medical Officer of Health will be glad to confer with either Managers or Teachers on the subject.

By Direction of the Medical Officer of Health.

.....

Inspector of Nuisances.

To.....

.....

situate in.....

The disinfectors are sent out at once to disinfect the drains, and especially the w.c.'s, with carbolic acid (1 in 50); and if the case remains at home an oaken tub having an air-tight cover charged with sawdust and carbolic acid is sent to the house. It is removed every day or other day, as is found necessary, and its contents cremated at the Destructor and replaced by a cleansed and disinfected one.

When the case at home ends in recovery, the bedding, carpets, curtains, bed, mattrasses, &c., from the bedroom are removed to be disinfected by the steam disinfector, and the house-holder has the floor of the room scrubbed with carbolic soap. If it ends in death, the body is wrapped in a carbolic sheet, and the same means of disinfection mentioned above are practised.

Isolation in Hospital.

This is recommended as far as possible, but I have to exercise great care to see that patients are not removed either when moribund, or in such a dangerous condition that the removal itself is harmful. Enteric fever patients do not stand removal well, hœmorrhage from the bowels being very common shortly after admission to the hospital. Because of this the wheels of the ambulance are provided with pneumatic tyres, and the patients are always removed on the stretcher, but in the small houses it is impossible to place them on it at the bedside, because of the narrow staircases.

In 1898 the cases removed were 38 out of 67, *i.e.*, 56·7 per cent., whilst in 1899 there were 31 cases removed, *i.e*, 52 per cent

In 1898, out of the 38 cases, 10 died, and of the 29 cases, at home, 6 died; and in 1899, amongst the 31 cases, there were 8 deaths; and 8 deaths amongst the 28 cases at home. Since the hospital was opened in 1891 the deaths amongst patients in the hospital for enteric fever was 17·8, and with those at home 28·9 per 100.

Seasonal Prevalence.

The annexed table gives the cases, notified each month, for each of the years 1898 and 1899, and for the combined years 1891 to 1897. It is seen from the table that most cases are notified in October, next in September, and then in November and December.

Cases of Enteric Fever Notified.

	January.	February.	March.	April.	May.	June.	July.	August.	September	October.	November.	December.	Totals.
1898	7	7	4	3	1	2	7	7	12	8	4	5	67
1899	4	7	10	7	3	2	2	6	5	6	4	3	59
1891 to 1897	28	26	19	10	20	5	21	16	55	64	59	40	363
Totals	39	40	33	20	24	9	30	29	72	78	67	48	489

Epitome of Cases Notified in 1898 and 1899.

I append here a slight account of each case notified in the two years under consideration, in which I have tried to give any salient fact noticed with regard to the case.

Cases in 1898.

1. M. (7 years), Police Street, ill about three weeks when notified; doctor in attendance about thirteen days; patient had had mussels roasted before the fire. The drains of this house were satisfactory.

2. F. (70 years), Durham Road, doctor in attendance nine days when notified. Fatal. House built within last five years drains had puddle joints, which were leaky.

3. M. (50 years), Lower King Street; premises were in perfectly sanitary condition. No assignable cause.

4. F. (9 years), Cheltenham Road, ill for ten days when notified, doctor in attendance for one week. Slop-water discharges into a tank at the rear of the house, drain of cement joints, pail-closet.

5. F. (23 years), housewife, Thomas Street, ill ten days when notified, medical man in attendance six days ; drains satisfactory to smoke test, but puddle joints. The drains of this and other houses in the row are disconnected from the main sewer by a common intercepting man-hole.

6. F. (33 years), housewife, Exmouth Place, notified twenty-two days after onset, medical man in attendance seven days. Possibly contracted from case 1 ; said to have had the disease before. The drains and sewer therefrom were found to be blocked not disconnected from the sewer, and unventilated. The drain had puddle joints which were leaky.

7. M. (19 years), labourer (hod-carrier), St. James' Road, been off work four days when reported. Had had cockles to eat about a month previously on one occasion only. Drains cement joints, with a leaky joint near the air shaft; only one untrapped opening.

8. F. (16 years), housework, Belmont Avenue, onset indefinite. Drain puddle joints leaky, and only one untrapped opening

9. M. (23 years), cellarman, Oxford Road, began four days before notification with headache and diarrhœa. Was employed as cellarman at an hotel where there had been two cases of the disease in 1897. The drains of the house he lived in were puddle-jointed and leaky.

10. M. (15 years), Lytham Road, printer, off work thirteen days when notified, and a medical man in attendance eleven days. Drains have cement joints, are ventilated, and have only a slight defect near lower air shaft,

11. M. (10 years), scholar, Kay Street, ill seventeen days when notified. Sewage backs up under the floor of the front room when there is a high tide, or heavy downpour of rain. The drains are puddle-jointed and leaky.

12. M. (28 years), plumber, Ribble Road, ill twenty-seven days when notified. Drains cement joints, ventilated by one untrapped opening, a slight defect near air shaft.

13. F. (48 years), Glenwood Terrace, housewife, ill twenty-seven days when notified, medical man in attendance 24 days. She had been nursing an enteric fever case until taken ill. The drains of the house were leaky, and were puddle-jointed.

14. F. (31 years), George Street, housewife, ill tweny-six days when notified. A friend of this woman—who had been staying with her, slept in the same bed, and had lent her a woollen vest—had been nursing a sister for six weeks in Huddersfield during enteric fever. Drains puddle joints and leaky, yard w.c. leaky, there is an intercepting trap, but no untrapped opening. She had been staying for four days outside the borough, where the water supply is from a suspicious surface well, and she was taken ill on her way home. If she contracted her disease there the incubation period would be only four days.

15. F. (26 years), housewife, Bolton Street, onset indefinite, medical man in attendance seventeen days when notified. Drains puddle-jointed and defective.

16. M (32 years), railway ticket-collector, Railway Street, ill eleven days when notified, and medical man in attendance nine days. House liable to be flooded with sewage when the tide is high, or there is a heavy fall of rain. Drains puddle-jointed, leaky, disconnected, and ventilated by only one untrapped opening.

17. M. (33 years), employed at Tower, Abbey Road, ill and attended by medical man ten days when notified; had eaten raw mussels some time previously. The drains of this house, which

had cement joints, discharged into a cess-pool emptied regularly by the Corporation. There was a pail-closet, which consisted of a galvanised iron, pail emptied about once a week.

18. M. (43 years), blacksmith, Charles Street, off work sixteen days, and attended by medical man thirteen days when notified; said to have had the disease thirteen years ago. The water supply at the brickcroft where he had been working is from a pit, but there was no evidence that he had drunk any, although he was a water-drinker. Drains were defective and puddle-jointed, disconnected, and one untrapped opening; yard surface, brick, in bad condition.

19. F. (39 years), Bairstow Street, house-wife; 20. F. (15 years), Bairstow Street, house-work; said to have had boiled cockles within a month. There was a suspicion that the daughter contracted the disease in Burnley. Yard drains puddle-jointed and leaky.

21. M. (38 years), engineer at the Tower (see No. 17), Park Street, notified twenty-three days after onset, and ten days after he consulted his medical man; and fifty-three days after number 17. Drains cement joints, and satisfactory, except a leak at w.c. in yard. The surface of yard was concrete, in bad condition.

22. (10 years), scholar, Whiteside Street, twenty-five days after commencement of illness, and nine days after consulting a medical man. The drains of this house had just been re-laid, and were passed off as satisfactory two days after notification of the disease.

23. M. (cab-driver), Albert Street, had been ill thirteen days, and attended by doctor three days when notified. The drains of this house were found to be satisfactory.

24. F. (8 years), scholar, Portland Road; this would appear to have been contracted in Oldham, and only to have been notified when a relapse occurred. We were told that the house in Oldham

whence she came was most insanitary, and that there was a common privy for it and three other houses. The drains of the Black pool house had cement joints, and were satisfactory.

25. M. (22 years), cab-driver, Clifford Road ; ill about thirty-one days when notified, the medical man having been in attendance fourteen days. This man's wife buried two of her brothers from enteric fever about eleven weeks previously, near to Bilston, in Staffordshire. The house drains were satisfactory, but there was a leak at the foot of the soil-pipe.

26. M. (22 years), carter, Hawes Side; no evidence as to how disease was contracted. The drains had cement joints, with a leak at the slop-stone gully and one untrapped opening, and were attached to a cesspool. There was a pail closet here.

27. F. (21 years), visitor, Station Road; had been in Blackpoool twenty-seven days when disease was notified (died on day of notification). Suspicion attached to eight oysters that she ate ten days before death. She came to Blackpool because of her health, and from the shortness of time which elapsed between taking these and death I believe that they had nothing whatever to do with the causation of the disease. The sanitary arrangements of this house were satisfactory.

28. F. (9 years), scholar, Bloomfield Road ; ill about eleven days when notified. In this case there were no drains for the house, but there was a brick cesspool for the drainage from the cowshed which adjourned this farm-house. The method of excreta collection was a galvanized iron pail.

29. M. (13 years), assists in poultry trade, Back Eden Street; ill thirty-two days, and attended by medical man twenty-six days before notification. Ate a quantity of ice-cream three days before he first showed symptoms. Yard and drains of this house in a very dirty condition ; the surface was formed of brick, and, seeing that it was used for killing and plucking poultry, its condition can better be imagined than described. Drains were puddle-jointed and leaky.

30. M. (55 years), secretary, Withnell Road ; his office was in Manchester. Ill and attended by medical man fifteen days when notified. Drains were defective, the joints were made of clay puddle ; otherwise satisfactory.

31. M. (16 years), photographer's assistant, Coronation Street ; ill fourteen days and attended by doctor four days when notified. The drains of this house were puddle-jointed and inefficiently ventilated.

32. M. (4 years), Caunce Street ; had removed into this house from Cocker Street three weeks previously, and had been ill nine days when notified. Drains of house in Caunce Street were defective, being puddle-jointed, and yard surface partially flagged, and in a bad condition.

33. M. (5 years), Caroline Street ; ill one week and attended by medical man three days when notified. This child was said to have had large quantities of ice-cream. The drains of this house were puddle jointed and leaky, with a defective yard surface.

34. F. (9 years) ; 35. F. (31 years), Gipsies encampment, South Shore ; the girl commenced to be ill on August 19th, and was nursed by her mother, who commenced to be ill on August 26th. Both were removed to the Sanatorium and recovered. These patients lived in a tent ; there were no drains. The water supply was nominally obtained from the mains of the public water supply, but it is a practice amongst these people to sink small wooden tubs into the sand, and use the water which percolat
various domestic purposes. These tubs are very liable to contamination from the many thousands who frequent the sands. Fortunately no other cases occurred in connection with these cases.

36. M. (28 years), Park Road, photographer ; ill ten days and attended by medical man five days when notified. The disease was contracted at the studio, in Church Street, where the drains

and w c. were in a defective and leaky condition. The drains of the house in Park Road were defective, and the joints were made with clay puddle.

37. F. (7 years), scholar, Victor Street ; ill eleven days, and under care of medical man seven days when notified. Had repeatedly had ice-cream ; drains were found blocked, and the basin of the w.c. broken. The drains on examination were found to be leaky and to be jointed with clay pnddle. Drains were not disconnected, nor ventilated, and the houses are liable to be flooded with sewage when the tide is high, and the rainfall heavy.

38. F. (3 years), Caunce Street ; this case occurred in the same house as number 32. Case 32 was removed on August 17th to the hospital, and this patient commenced to be ill on September 2nd ; notified and removed to the hospital on September 8th. (For condition of drains see case 32).

39. M. (32 years), stonemason, Elizabeth Street ; ill about five weeks, and medical man in attendance thirty-three days before notification. Drains of this house were satisfactory.

40. M. (69 years), no occupation, Chesterfield Road ; on August 22nd he had some boiled cockles ; was not well on the 23rd, and complained of loss of appetite. After that continued languid and tired until September 18th, when he had a shivering fit. He called upon his medical man on that day ; he gradually got worse, and took to bed on September 23rd. The case was notified on the 26th, and death occurred on the 27th. His son had some of the same cockles, and during the following night had diarrhœa, and was not well for some days. His wife had some, but she was not affected. The drains of the house were found satisfactory.

41. M. (35 years), visitor, West Caroline Street ; arrived in failing health from Leek, Staffordshire, on September 15th, and on the 25th became so ill that he had to go to bed and call in medical

advice. It was notified as enteric fever on October 1st, the day of death. The drains of this house had been relaid some months previously, and were found satisfactory.

42. F. (44 years), domestic servant, St. Helier's Road; commenced to be ill when in service near the Central Station. Drains of the house in St. Helier's Road emptied into a cesspool; pail-closet used here. Subsoil is damp and peaty, and no provision made against either dampness or emanations from ground by concreting, etc., the site.

43. F. (23 years), domestic servant, Benson Lane; had been ill ten days, and attended by a medical man seven days when notified. The drains of house were disconnected; had only one untrapped opening, and were found to be leaky at the yard water-closet, and the air-shaft.

44. F. (27 years), domestic servant, Stoney Croft; not well for about six weeks before disease was notified, being languid and having pains in the back and limbs. She therefore left the house in Lytham Road, where she was engaged, and went home to Stoney Croft after this had continued one month.

45. F. (25 years), housewife, Caunce Street; began to be ill nine days, and attended by doctor five days before notification, Householder complained of smells in back kitchen of the house. On examination water was found standing 8in. deep under the floor of back kitchen, and to a depth of 2in. or 3in. under kitchen and front sitting-room. The yard drain was only found leaky at the gully for surface water near the yard door.

46. M. (26 years), fishmonger, St. Helier's Road; ill ten days, and attended by medical man nine days when notified. The drains of house emptied into cesspool, had cement joints, were ventilated with one untrapped opening, but otherwise satisfactory. There was a pail closet in use here.

47. M. (21 years), carter, Moister Road; ill thirteen days, and under the care of a medical man eight days when notified.

This patient had been carting to Thornton, where enteric fever was at that time prevalent. The house was a new one, only certified for habitation seven months before. Drains were found satisfactory on examination, except ventilated by only one untrapped opening.

48 M. (7 years), Watson's Lane; had been ill ten days when case was notified. Drains were satisfactory, having cement joints, and ventilated by two untrapped openings. There was a galvanised pail in the yard, instead of a w.c.

49. M. (28 years), commercial traveller, Caunce Street, next door but one to Cases 32 and 38; ill 18 days, and attended by medical man eleven days when notified. On the day that he first fell ill he had had some raw mussels. The drains of this house were satisfactory, but ventilated by only one untrapped opening; the yard surface was flagged, and was in bad condition.

50. M. (23 years), off Church Street; he was a barman at an hotel where two cases of the disease occurred in 1897, and he was lodging at premises whose drains were in connection with Case 36. Had been ill for over a month, and was attended by a medical man four days before notification. This case was moved too late, and rapidly ended fatally. Drains of the house were very defective, being puddle-jointed, without an intercepting trap between them and the sewer, and were not ventilated. This stands in a yard where a large number of horses are stabled, the surface of which was in a very bad condition, and there was a large accumulation of horse manure. These stables and cottage have since been demolished.

51. M. (43 years), fitter, Boothley Road; ill seven days, and under medical treatment three days when removed to Infectious Diseases Hospital. He had had some boiled cockles 23 days before he first felt ill. Possibly he may have contracted the disease at the Alhambra, where he was working, through the indiscriminate manner in which the workmen defæcated about the

building during its construction. The drains were satisfactory, but ventilated by only one untrapped opening. Surface of yard was flagged in bad condition.

52. F. (40 years), bath attendant, Yorkshire Street; ill about sixteen days, and attended four days when notified. The house had leaky puddle-jointed drains, with only one untrapped opening.

53. M. (17 years), ice-cream dealer, Kent-road; was employed also potato cleaning at a shop in Chapel Street, where the sanitary condition was not satisfactory. The w.c. in house, and gully in cellar area, was found leaky. (See Case 24, 1899.)

54. M. (21 years), waiter, Church-street; ill twelve days. and under care of a medical man eleven days before notification, The two yard w.c.'s leaky, the drains generally leaky, and with defective puddle joints. The cellar drain was leaky, and not disconnected from the sewer. His work would take him very often into the cellars.

55. M. (27 years), Richmond Road, cabdriver until Sept. 24th, afterwards a labourer; ill on October 18th, medical man called in October 23rd, notified October 29th. The drains had cement joints and were satisfactory, but the trap under the w.c. in the yard was broken, and therefore did not act.

56. F. (18 years), housework, Balmoral Road: not well for a month before notification, and medical man had been ten days in attendance. She had some oysters on October 15th, and her mother also. The medical man was called in on November 9th, and the disease notified on November 19th. Some suspicion attached to these oysters, but I did not think there was any connection between them and the enteric fever. The sanitary condition of the house was satisfactory, but the sewer into which the drains lead is a sewer of deposit, and requires to be emptied of its solid contents by dredging, which takes place occasionally.

57. F. (22 years), house-work, Withnell Road; ill for three weeks, and attended by medical man eight days before notification. Patient had noticed bad smells in front street. The drains of the house were defective with puddle joints. There was a drain in the cellar which had defective puddle joints, but disconnected from the sewer by an intercepting trap. Here, again, the sewer is laid at such a slight level, and such a quantity of sand finds its way therein, that scarcely any of the solid matter in the sewage is discharged from the sewer.

58. M. (16 years), saddler, East Topping Street; not well for about six weeks and called to see a medical man on November 22nd. Was notified as a case of enteric fever on November 28th. The drains of this house were satisfactory.

59. F. (27 years); 60. F. (27 years); both nurses at the Infectious Diseases Hospital. Unfortunately they contracted the disease whilst in the execution of their duty.

61. M. (37 years), Coop Street, labourer; had been working in a sewer about sixteen days. He was taken ill and a medical man summoned on November 30th, and the case notified on December 9th. The drains had mixed joints of cement and clay-puddle, and were found leaky at the yard w.c., the slop-gully, and near the air-shaft.

62. F. (7 years), Edward Street; case number one lived in a cottage near to the yard of this house. Notified on December 13th, was ill for first time on December 7th, and medical man called in December 9th. Drains had puddle joints and were defective.

63. F. (10 years), Tyldesley Terrace; from the subsequent history of this case there is little doubt that the cause of the illness and death was tubercular meningitis and not enteric fever.

64. M. (28 years), New Road, licensed victualler; had led a very reckless and intemperate life recently. Was notified to have enteric fever on December 22nd, the doctor having been called in on December 15th. Was then said to have had diarrhœa about a month

ago, and to have had a quantity of raw mussels on November 25th. The drains of these premises were jointed with clay-puddle and were defective.

65. F. (15 years), domestic servant, Station Road; not well since December 5th, and was notified to be suffering from enteric fever on December 16th. She went home to Thornton to nurse her mother and brother who were ill with typhoid fever, and returned to service on December 9th, i.e., four days after she first became ill. No doubt she contracted it whilst nursing her relations, and therefore it was imported from Thornton.

66. F. (20 years), housewife, Buchanan Street; complained of pain in abdomen on November 30th, and medical advice was sought on December 3rd. Was notified to be suffering from enteric fever on December 26th. The joints of the drains were made of puddle and were defective, the yard w.c. was leaky, and there was an open ashpit. The yard was brick and in bad condition.

67. M. (20 years), barman, Promenade; first complained of being ill on December 6th, medical man called in on December 16th, and notified on December 27th. This case occurred in a new and expensive building. The drains were found to be satisfactory, except there was a leaky gully in the urinal, and there was no lower untrapped opening.

Cases of Enteric Fever in 1899.

1. M. (29 years), no employment, Central Drive; complained first on December 24th, medical man called in January 2nd, and notified Januay 9th. Had been out of work for three months, during which time he had been continually drinking. The drains of the house were leaky and defective.

2. M. (27 years), joiner, Brown Street; the disease was probably contracted at the Alhambra, where he worked (see case 51 in 1898). Ill decidedly on December 22nd, a medical man summoned on December 23rd, and notified as enteric fever on January 10th. The drains were puddle-jointed and leaky.

3. M. (20 years), clerk, Hornby Road; had eaten rather freely of oysters between December 25th and January 1st. The disease was notified on January 18th. No source of infection was discovered in connection with the office in Manchester. The yard drains were puddle-jointed and leaky. The drain in the cellar was in the same state, and this was neither disconnected from the sewer nor ventilated.

4. M. (26 years), bricklayer, Wood Street; began to be ill on January 7th, a medical man was called in on January 9th, and was notified as enteric fever on January 21st, on which day he died. There was a foul ditch behind this house, the drains which were of cement joints and ventilated by one untrapped opening, emptied into a cesspool. There was a galvanised-pail closet.

5. M. (30 years), employé at Tower Menagerie, Peter Street; first complained of headache, &c., on January 19th, gradually got worse and called in his medical man on February 1st. The case was notified on February 4th. On January 12th or 13th he had some boiled mussels. The drains of this house were puddle-jointed and leaky, with only one untrapped opening.

6. M. (35 years), labourer, Gorton Street; during first and second weeks in December he was engaged lowering a branch sewer from the Victoria Street sewer, and occasionally vomited through the bad smells emitted therefrom. On December 28th he began to work at some brickworks at Thornton, and drank some water which came out of some field tile drains in this brickfield. Diarrhœa commenced at once, and continued until January 23rd. He noticed some spots on abdomen on January 14th. On January 23rd he called in a medical man who notified it as enteric fever on February 6th. This was evidently a relapse. This house had puddle-jointed and leaky drains, ventilated by one untrapped opening only.

7. F. (18 years), dressmaker, Milbourne Street; not well for three weeks, and on January 31st appeared to have a bad cold, and gradually got worse. Medical man called in on February 4th, and notified on February 8th. She was removed to hospital that day and

died a few hours afterwards. The yard drains were leaky, with defective puddle joints. They were not disconnected nor ventilated. The yard was bricked and in bad condition.

8. F. (45 years), housewife. Flagcauseway. Complained of feeling drowsy and tired on January 31st; called in her medical man on February 6th, and it was notified as enteric fever on February 9th. Her husband was a district foreman in the Highway Department, and possibly the infection might have been introduced in that way. The drains of this new house had cement joints, and were satisfactory to the smoke test, except at the foot of the lower air-shaft, which is intended for the untrapped opening for the admission of air to the drain.

9. M. (14 years), joiner's apprentice, St. Helier's Road; came home from work ill on February 9th; called in medical man on February 16th, and disease was notified on February 22nd. The drains were jointed with cement, and satisfactory.

10. M. (16 years), barman, New Road; a few doors from case 64 in 1898. Commenced with a shivering fit on February 6th, and got gradually worse. Doctor called in on February 22nd, and disease notified on February 24th. He had eaten raw mussels frequently purchased from hawkers in the vaults. The drains had been relaid in June, 1896, and made satisfactory, but on being retested after the case of enteric fever occurred were found to be leaky again.

11. M. (18 years), butcher, Rydal Avenue; came home from work ill on February 16th, and sent for medical man on February 17th. It was notified on February 27th; the drains of this house were found leaky at the gully for rain water.

12. M. (5 years). 13. F. (32 years), housewife, Belmont Avenue; the boy began with pain in abdomen, languor, and fits of vomiting on February 10th, and the mother began on February 20th. A medical man was called in on February 27th, and the disease notified on March 4th. The drains were defective, and had puddle joints. They were disconnected, but had only one ventilating shaft. The pan in the yard water-closet was broken.

14. M. (29 years), labourer, Stoney Croft (see case 44, 1898, and case 41, 1899) ; ill for about three weeks, and then came home ill on February 27th ; medical man sent for and notified on March 4th. The drains of this house were puddle jointed and unventilated. They were disconnected from the sewer by one intercepting trap, but not from the drains of the two adjoining houses, in one of which the cases above mentioned occurred.

15. F. (15 years), shop-assistant, Lytham Road ; began with headache and feeling of languor three weeks ago, and sent for medical man on March 6th, who notified it as enteric fever on March 8th. The drains were puddle-jointed and leaky.

16. M. (15 years), assists his father, a cowkeeper, Rawcliffe's Yard ; complained of feeling languid and tired, with some headache and vomiting on February 22nd ; doctor sent for on February 27th, and disease notified on March 13th. At that period the case could not be removed, and he died on March 15th. From February 22nd to March 13th, these people, who owned six cows, had been conducting their milk business as usual. Case 14 had milk from a relation, who kept cows, and lived in Rawcliffe's Yard. The drains were very defective, and were not connected to the sewer ; in fact, the whole premises were in a deplorable insanitary condition.

17. M. (33 years), blacksmith, Lewtas Street ; first noticed not to be well February 21st., called to see his medical adviser on February 26th, and the case was notified on March 13th. This house was first used for habitation on June 22nd, 1896, and when tested the drains were puddle-jointed, leaky, and inefficiently ventilated.

18. M. (23 years), boots at an hotel, Promenade ; not well from February 19th to March 3rd. Medical man then called in, who notified the case on March 14th. This man ate some raw mussels from a hawker in the vaults about February 5th. The drains had both cement and puddle joints, and were leaky in places.

19. M. (25 years), fireman, Belmont Avenue, uncle and brother-in-law of Cases 12 and 13 ; he started to be ill on March 12th *i.e.*, five days after removal of the other two.

20. M. (33 years), wheelwright, Pleasant Grove; had a few steamed mussels about a month before March 4th, when he first complained of headache, &c. His medical man, who was called in on March 11th, notified the case on the 27th. The drains were satisfactory and well ventilated, but they were disconnected from the sewer by means of a disconnecting manhole, along with 14 other houses.

21. M. (20 years), station loafer, Gavan Street; was removed to Infectious Diseases Hospital, and proved not to be a case of enteric fever.

22. F. (8 years), Ash Street, commenced with violent pain in abdomen on March 26th, medical man summoned on March 27th, and notified on April 5th. The drains were satisfactory.

23. M. (9 years), Ashburton Road; patient complained of pain in abdomen on April 3rd, and medical adviser was sent for on April 6th. The case was notified on April 10th. This was a new house occupied in August, 1897, and the drains were found to be leaky when tested.

24. F. (22 years), housework, Hawes Side; complained of feeling cold with pains all over her on April 3rd. The medical man who saw her first on April 6th notified the case on April 14th. The drains were defective, with puddle joints, and run into a cesspool common to other houses, the overflow of which discharges into Spendyke. The drains are not ventilated. There is also a privy common to this and other houses.

25. F. (6 years), Chapel Street. This case was at the shop next door to where Case 53 (1898) worked, and to which suspicion was attached. These premises were at that time in a very insanitary condition; the drains were leaky, puddle-jointed, unventilated, and without a disconnecting trap.

26. M. (4 years), Brighton Grove; patient first complained on April 6th, the medical man was called in on April 7th, and case notified on April 17th. It is worthy of notice that the mother of this patient died on April 13th, after three weeks' illness, and that the

cause of death was certified to be pneumonia. The drains of this house were defective and leaky, and the joints formed of puddle. The w.c. in the yard was leaky, the surface of the yard was of brick and in bad condition, and there was no proper ash receptacle.

27. F. (28 years), Lansdowne Crescent; had been attended by medical man for various ailments for six weeks before April 21st, when she was notified as suffering from enteric fever. She had been on visits to several towns during that period, and possibly contracted the disease there. The drains were leaky, and the yard w.c. also, and there is a defective common drain filled with deposit running close to the foundations of the house.

28. M. (63 years), farmer, off Lytham Road; not well for some time, medical man called in on April 16th, and he died on April 29th, the certificate of notification being received on April 30th. The drains were leaky and defective.

29. F. (12 years), Palatine Road; she had recently had cockles to eat twice, on the first occasion on April 7th; was not well for some time, and on May 4th her medical adviser was sent for, who notified enteric fever on May 8th. The drains of this house were found to be satisfactory.

30. M. (35 years), town employè, Charnley Road; patient had eaten some raw mussels, which he had gathered from the shore, near Cleveleys, about five weeks before the disease was notified on May 25th; did not feel well on May 7th, and he got gradually worse until a medical man was summoned on May 17th. The drains of this house were satisfactory.

31. F. (51 years), housewife, South Beach; had not been well for a few days before May 6th, when she consulted her medical man, who notified it as a case of enteric fever on May 31st. She had some oysters between May 6th and 13th, but these could not be blamed for the disease. Leaky, puddle-jointed, and inefficiently ventilated drains at this house.

32. F. (7 years), scholar, Tyldesley Road; a month previously

to notification, *i.e.*, about 5th May, she played on the sands, near the sewer outlet, and did not feel well when she came home. About a week afterwards she began to be seriously ill, with a shivering fit, etc A medical man was sent for on May 28th, and the disease notified on June 2nd. The drains were leaky in several places, especially at the yard water-closet, and gully in cellar area. The joints were made with puddle. The basin of the yard water-closet was broken ; the drains were properly ventilated. House water-closet was in good order.

33. F. (52 years), housewife, South Bank Street ; began with pains in abdomen, and languid feeling, about May 22nd. A medical man was called in on May 31st, and the disease notified on June 3rd. The drains of this house were jointed with puddle, were leaky, and were ventilated with only one untrapped opening.

34. F. (7 years), scholar, Livingstone Road ; first complained of headache on June 26th, and was noticed to be languid. On July 9th a medical man was called in, and disease was notified on July 10th. The drains of the house were defective and leaky, all joints being made with puddle. The water-closet in yard was leaky. The surface of the yard was brick, and in bad condition.

35. M. (23 years), clerk, Queen Street ; about June 24th, began to be drowsy and languid, with headache. First consulted a medical man on July 12th, and disease was notified on July 17th. The drains were leaky, with puddle-joints.

36. F. (32 years), housewife, Peter Street ; said to have had influenza from July 13th, but performed her household duties until July 25th, when she was ordered to bed by a medical man, whom she then called in. The disease was notified on August 3rd. The drains were leaky, having neither intercepting trap from the sewer, nor ventilating opening.

37. F. (11 years), scholar, Cookson Street ; went to same school as case 34. Commenced to be ill in school July 18th ; doctor called in July 28th, and case notified August 3rd. The drains were puddle-jointed and leaky.

38. M. (33 years), Everton Road ; had been employed laying new sewers at St. Annes until August 5th. Began to be ill on August 8th, medical man sent for on August 15th, and case notified on 16th The drains of this house were satisfactory.

39. M. (3 years), Wood Street ; medical man sent for August 8th, and notified on August 14th. The drains were leaky at the yard water-closet.

40. F. (22 years), domestic servant, Carshalton Road ; not well from July 31st, and she only went to this house on July 26th, having stayed in Charles Street from July 19th to July 26th. Medical man called in on August 7th, and notified case on August 20th ; previous to July 19th was in service in Egerton Road. The house in Carshalton Road was a new one, and certified July 6th. 1897, but the sewer in the front street for surface wastings and rain water was not connected to a sewer. The drains were found to be satisfactory.

41. F. (16 years), shop assistant, Erdington Road; first complained of illness on August 11th, medical man sent for on 19th, and disease notified on 22nd. At the shop, which was a recently-built lock-up shop, it was found that the rain-water pipe was directly connected to the drain, and all the joints were leaky, there was also a leaky gully in cellar.

42. M. (58 years), cab proprietor, Stoneycroft ; father of case 44 in 1898. The yard drains were found to be satisfactory, but with an intercepting trap common to it and the two adjoining houses, in one of which a case of enteric fever occurred. See case 14 in 1899.

43. M. (5 years), scholar, Brook Street ; commenced with diarrhœa on August 25th, medical man called August 29th, and notified on September 1st. The sewers in this and adjoining street were above half filled with deposit, owing to small quantity of water used by the tenants, the slight fall in the sewers, and to them not being connected with the main sewer, but being allowed to overflow into Spendyke. A slight defect was found in the drains at the foot of the ventilating shaft.

44. F. (18 years), shop assistant at Tower, East James Street; began to be ill August 29th, and medical man sent for September 6th, notified September 13th. The drains were leaky and puddle-jointed and not separated from the sewer by an intercepting trap.

45. F. (17 years), housework, Eccleston Road; doctor called in September 7th, and case notified on September 18th. When drains were examined the yard w.c. was found leaky, but otherwise they were satisfactory and the joints were cement. They were ventilated with two untrapped openings.

46. M. (49 years), lodging-house keeper, Derby Road; first symptons on August 30th, medical man called in September 11th, and notified on September 18th. The drains of this house had been relaid and were passed off as satisfactory on May 16th, 1899. The drains were found on being re-tested to be still satisfactory.

47. M. (54 years), hotel-waiter, Egerton Road; ill from September 6th, medical man called in September 20th, and notified September 27th. The drains were satisfactory.

48. M. (45 years), drill instructor, St. Helier's Road; about September 13th had some oysters with a friend. The friend was ill with diarrhœa next day. Patient only complained of headache and weakness. Doctor called in September 24th, and notified on October 10th. The drains were satisfactory.

49. M. (24 years), joiner, Park Avenue; was living in Granville Road until October 4th, and had been too weak and ill since about September 14th to follow his employment. A medical man was called in to attend him for this illness on September 26th, and the case was notified on October 12th.

50. F. (23 years), housework, Withnell Road; medical man consulted October 6th, and disease notified October 17th. The drains of this house were found to be satisfactory.

51. M. (50 years), Chapel-keeper; 52. F. (55 years). Cross Street. The husband began with shivering fit on September 21st,

gradually got weaker until October 9th, when the medical man was sent for. The disease was notified on October 22nd, and he died on October 24th. It is possible this was contracted through cleaning out the closets at the school. The wife, who nursed him, complained of being languid and tired since October 14th, got gradually worse, and on October 24th diarrhœa set in. She died on October 30th. The singularity about these cases is that they both undoubtedly had severe attacks of enteric fever in 1886, and had been accustomed for years, until 1893, to nurse and mix with enteric patients. The drains of the house were leaky, and puddle-jointed. The yard w.c. was leaky, and the drain from it blocked. The yard was cobbles and brick in a bad condition.

53. M. (11 years), scholar, Belmont Avenue; ill since about September 24th, medical man attending since October 6th, and notified on October 22nd. This house had leaky, puddle-jointed, and inefficiently ventilated drains.

54. F. (24 years), laundress, Promenade; patient worked in the same hotel as Case 50, 1898. Although the drains had been repaired aud had been arranged on the best possible system, still a defective sewer had been allowed to run under one portion of the building. First ill on October 11th, medical man called in October 25th.

55. M. (47 years), cab-proprietor, Cookson Street; this was a doubtful case of the disease. From about September 25th to October 9th, confined to house with a cold; from October 9th to 12th was ill in bed. On October 15th started with pneumonia, and then got better until 25th; on October 26th he had a vigor, and temperature again rose until death on October 30th, on which day I was informed of the suspicion that it was enteric fever. The drains were leaky and puddle-jointed.

56. F. (11 years), visitor, Lytham Road; this was an imported case; she arrived from Oldham on October 26th already ill. A medical man was sent for on October 31st, and the case was notified on November 3rd. The drains of the house in Blackpool were leaky and puddle-jointed, and only ventilated by one untrapped opening.

57. M. (27 years), shirtcutter, Woodfield Road ; this was also an imported case ; he commenced to be ill in Manchester on November 1st, and came to Blackpool on November 7th, when a medical man was called in ; the case was notified on November 14th. This house was possessed of leaky and puddle-jointed drains.

58. F. (24 years), theatre attendant, Warley Road ; she was a visitor, and probably contracted the disease at a theatre in Leeds. She arrived in Blackpool on November 15th, and complained on that day of being languid and tired ; she got gradually worse and called in a medical man on December 2nd, who notified it as a case of enteric on December 9th. The only defects found in the drains were some leaks in the soil pipe.

59. M. (21 years), butcher, Lytham Road ; commenced with a cold on November 30th, and about December 19th he found a dead sheep in the field, which he buried in a manure heap. He complained of the smell, and then became ill, and rapidly got worse, sending for a medical man on December 21st. The certificate of notification was received on December 30th, and he died on January 1st. His brother had enteric fever in this house in August, 1897. The drains here were leaky and puddle-jointed.

Sanitary Condition of the Premises.

The result of a careful examination of the drains of the houses in which enteric fever occurred in 1898 and 1899 and the application of the smoke test I have tabulated in the form given below. In 1898 there were 64 houses, and in 1899, 55 houses invaded.

	1898.	1899.
Houses with drains having cement joints satisfactory to the smoke test	21	13
Houses with drains having cement joints, but more or less leaky to the smoke test	9	12
Houses with drains having puddle joints satisfactory to the smoke test	4	4
Houses with drains having puddle joints, but leaky to the smoke test	27	26
Houses, tents, &c., without drains	3	—
	64	55

	1898.		1899.
Houses having drains disconnected from sewer by intercepting trap	51	..	45
Houses having drains not disconnected from sewer by intercepting trap	9	..	9
Houses having drains disconnected from sewer but not from adjoining houses	1	..	—
Houses having drains disconnected from cesspool by intercepting trap	—	..	1
Premises without drains	3	..	—
	64		55

Houses with w.c. in house and in yard, both satisfactory	11	..	15
,, ,, ,, satisfactory and in yard leaky	2	..	1
,, ,, ,, and in yard, both leaky	—	..	4
,, ,, in yard only, which was satisfactory	24	..	11
,, ,, ,, ,, ,, leaky	20	..	22
,, with pail closet	5	..	1
,, ,, privy	—	..	1
Premises without sanitary convenience	2	..	—
	64		55

Houses having drains ventilated by two or more untrapped openings	26	..	26
Houses having drains ventilated by one untrapped opening	23	..	22
Houses having drains unventilated	12	..	7
Premises without drains	3	..	—
	64		55

Houses with cellar drains satisfactory	5	..	6
,, ,, ,, leaky and not disconnected	3	..	4
,, without cellar drains	56	..	45
	64		55

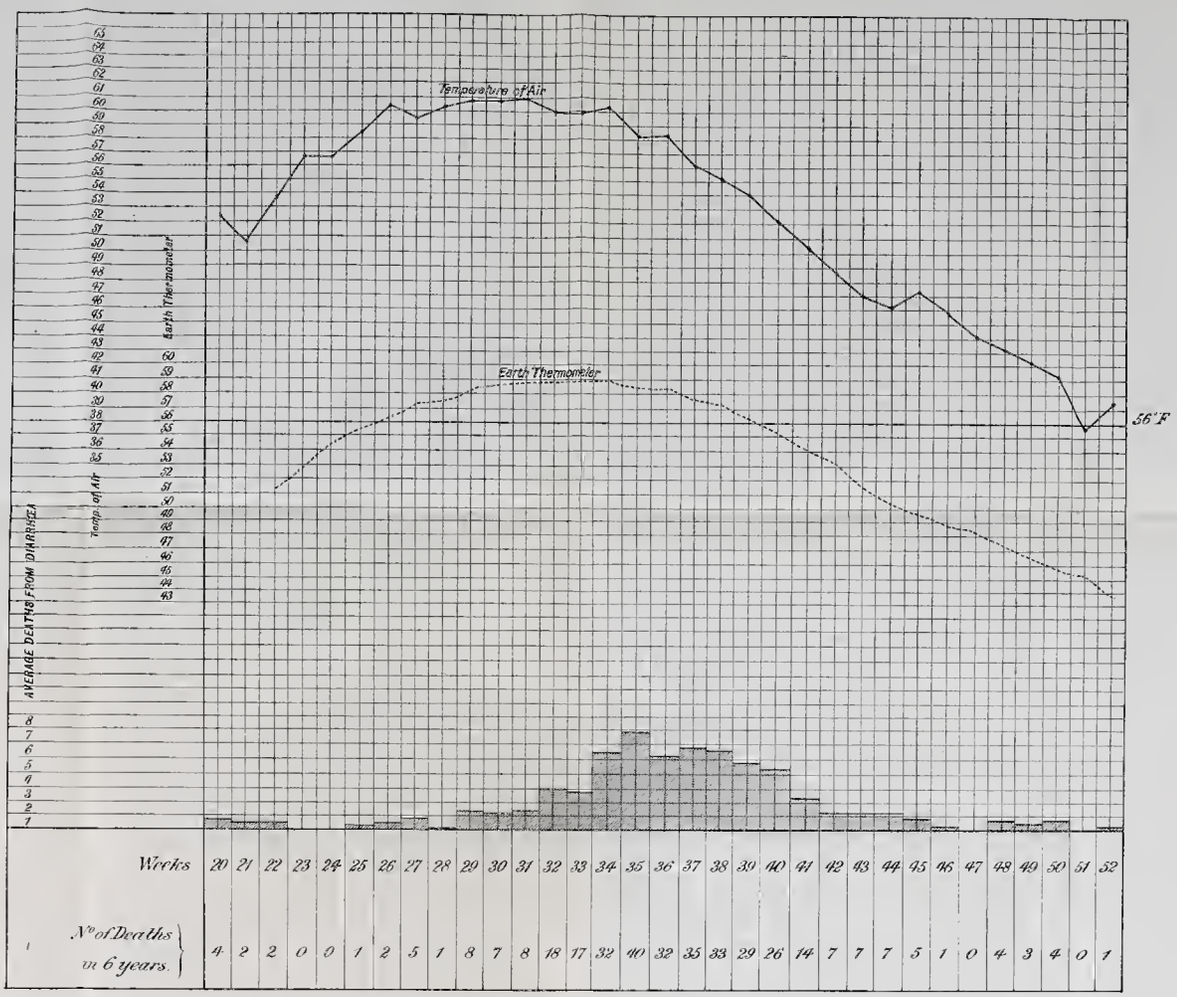
	1898.		1899.
Houses with ordinary wooden ashtubs	53	..	36
,, approved modified ash receptacle	3	..	—
,, covered ashpit	1	..	3
,, galvanised pail for ashes	—	..	3
,, improper ash receptacles	4	..	3
,, no ash receptacle	3	..	10
	64		55
Houses with yards flagged	33	..	33
,, ,, ,, and in bad condition	6	..	7
,, ,, concreted	1	..	—
,, ,, ,, and in bad condition	1	..	—
,, ,, bricked	8	..	4
,, ,, ,, and in bad condition	7	..	2
,, ,, asphalted	3	..	—
,, ,, flagged and tiled	—	..	2
,, ,, paved with cobbles, in bad condition	3	..	6
,, ,, unformed	—	..	1
Premises with no yards	2	..	—
	64		55
Houses with ground or basement floor flagged	11	..	11
Houses with ground floor, wood wholly or in part	51	..	44
Tents formed on the sands	2	..	—
	64		55

II.—DIARRHŒA.

The deaths from diarrhœa are mostly amongst children under twelve months of age, and, therefore, an inquiry into the causes thereof is largely concerned with the subject of infantile mortality. The infant mortality and the diarrhœal rates are both larger than one would expect in a district of the character of Blackpool. For the sake of comparison I give in the subjoined table the infant mortality and diarrhœal rate for a number of years as compared with that in the 33 great towns.

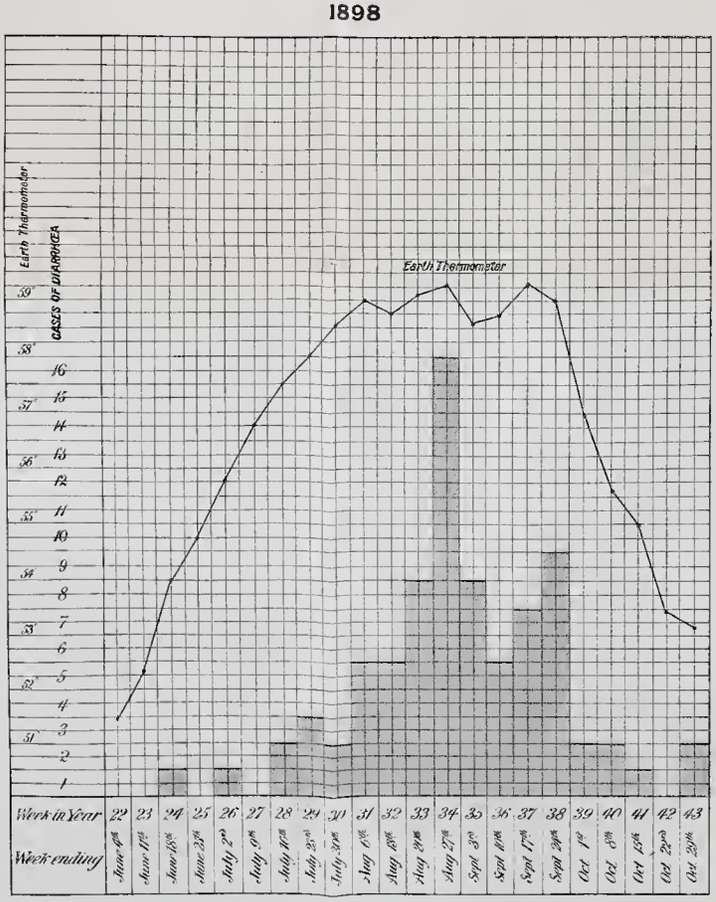
DEATHS FROM DIARRHŒA

Average for 6 years 1894 to 1899.



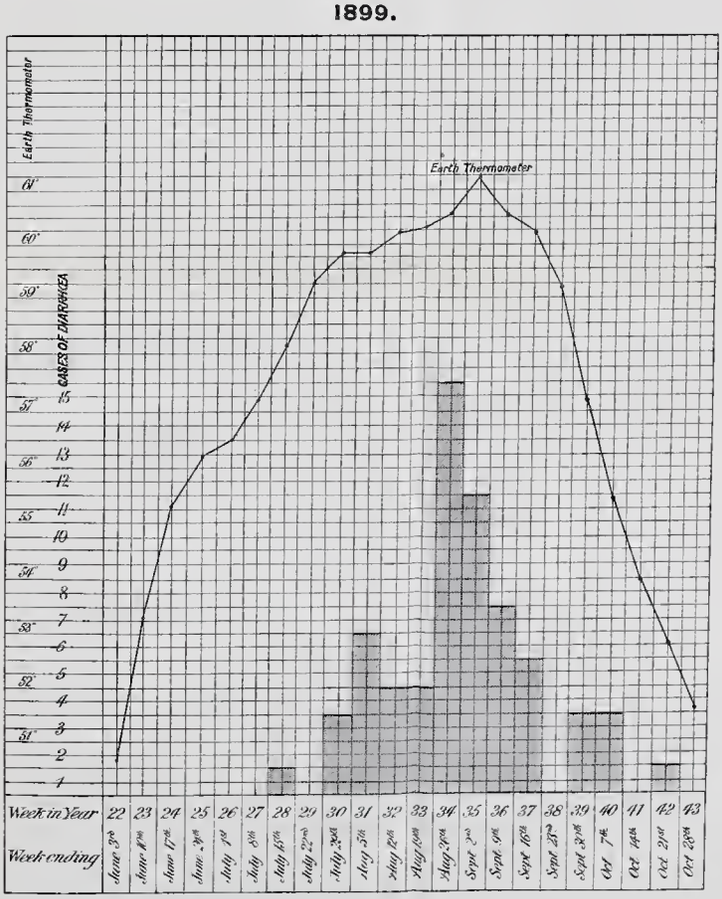
Weeks	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
N° of Deaths in 6 years.	4	2	2	0	0	1	2	5	1	8	7	8	18	17	32	40	32	35	33	29	26	14	7	7	7	5	1	0	4	3	4	0	1

1898



Week in Year	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Week ending	June 4th	June 11th	June 18th	June 25th	July 2nd	July 9th	July 16th	July 23rd	July 30th	Aug 6th	Aug 13th	Aug 20th	Aug 27th	Sept 3rd	Sept 10th	Sept 17th	Sept 24th	Oct 1st	Oct 8th	Oct 15th	Oct 22nd	Oct 29th

1899.



Week in Year	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Week ending	June 3rd	June 10th	June 17th	June 24th	July 1st	July 8th	July 15th	July 22nd	July 29th	Aug 5th	Aug 12th	Aug 19th	Aug 26th	Sept 2nd	Sept 9th	Sept 16th	Sept 23rd	Sept 30th	Oct 7th	Oct 14th	Oct 21st	Oct 28th

Year	Deaths of children under 12 months per 1,000 births.		Deaths from diarrhœa, per 1,000 inhabitants.	
	Blackpool.	Great Towns.	Blackpool.	Great Towns.
1884	146		1·288	1·31
1885	174		0·610	
1886	151	169	1 27	1·16
1887	116		0·88	0·69
1888	136		0·24	0·32
1889	168		0·51	0·61
1890	181	172	0·92	0·77
1891	181	167	0·95	0·67
1892	158	164	0·37	0·7
1893	210	181	1·44	1·23
1894	210	152	0·43	0·57
1895	206	182	2·09	1·20
1896	158	167	0·90	0·79
1897	191	177	1·29	1·24
1898	178	178	2·224	1·22
1899	184	181	1·68	1·21

These are rates which are calculated from the total number of deaths, without any correction for the deaths of visitors.

Of the deaths from diarrhœa in Blackpool I find that from 1891 to 1897, inclusive, 76 per cent. were under twelve months old; in 1898 84 per cent., and in 1899 81 per cent.

It has been suggested by Dr. Newsholme, Medical Officer of Health for Brighton, that the best means of comparing these diarrhœal deaths would be to calculate the number of deaths from diarrhœa, under twelve months old, to every 1,000 births in the same period.

This, I could give for Blackpool, but as there are no similar statistics available for other places to compare them with, I have contented myself with calculating the total deaths from diarrhœa in proportion with every 1,000 births for each year, and comparing them with similar figures, calculated out by Dr. Newsholme. There may be some difference in the proportion of deaths at different ages from diarrhœa in the various towns, but I do not suspect that there is any great variation, and we may take it that about 80 per cent. of the diarrhœal deaths are under 12 months old.

The result is as follows :—

Year.	Deaths from Diarrhœa, per 1,000 births.	Year.	Deaths from Diarrhœa, per 1,000 births.
1883.	27·1	1892.	23·3
1884.	44·8	1893.	73·6
1885.	26·3	1894	28·9
1886.	49·2	1895.	83·9
1887.	36·8	1896.	44 7
1888.	9·9	1897.	49·2
1889.	26·1	1898.	80·1
1890.	39·8		
1891.	42·4	Average for 1883-1898.	42·9
1899.	63·0		

The rate varies from 9·9 in 1888, to 83·9 in 1895. Unfortunately, I cannot give the rate for 1882. In *Public Health*, for December, 1899, Dr. Newsholme, gives the average annual death-rate for each of the great towns, for the seventeen years—1882 to 1898. These rates vary from 12·4 at Halifax, 15·7 at Huddersfield, and 18·8 at Bristol, to 41·3 at Blackburn, 42·0 at Bolton, 48·4 at Leicester, and 60·4 at Preston.

From this it is seen that Blackpool is only exceeded by Leicester and Preston.

Classification.

The classification of deaths under this head is very difficult and offers many temptations to the health officer who does not care to face facts fairly in the face or for various reasons wishes to make his diarrhœal rate look as small as possible. The reason of this is that diarrhœa is a symptom of many diseases, and there is a disinclination on the part of medical practitioners, and that a growing one, not to make use of this term as a cause of death, the reasons for which I need not enter upon. The result is that "gastro-enteritis," "enteric-catarrh," "muco-enteritis," and words of similar import bulk very largely in the returns. There does not seem to be any settled practice in the classification of these latter deaths, but before making any comparisons it is requisite that this point should be cleared up. For several years past I have stated what my own practice has been. It has been to include all the above-mentioned deaths, as well as those in which diarrhœa is stated to be secondary to some undefined cause, as marasmus, atrophy, dentition, and convulsions. "Enteritis" in young children I have also included. I, therefore, include "gastro-enteritis" and "muco-enteritis," which are excluded by the Registrar-General. The instructions issued from the Registrar-General's office are "Diarrhœa. Deaths from *intestinal* or *enteric catarrh* and from *gastro-intestinal* or *gastro-enteric catarrh* should be included under this heading. Diarrhœa should, however, be counted as the cause of death, *only when stated alone, or when coupled with some ill-defined cause of death*, such as atrophy, debility, marasmus, convulsions, teething, old age or senile decay." It is on these lines that the returns for the great towns are calculated.

There is no doubt that there is a constitutional disease of well marked symptoms, of which diarrhœa is one of the most important symptoms although it is not present in all cases, which assumes an epidemic form generally in the third quarter of the year, and is specially dangerous to the very young and the very old. We may call it what we like, epidemic diarrhœa, summer diarrhœa,

autumnal diarrhœa, thermic diarrhœa, or zymotic diarrhœa, but the above-described disease is what is meant. The cases of "gastro-enteritis," &c.. have the same symptoms and occur at the same seasons. They are therefore included by me as instances of the disease.

This subject has been deemed of sufficient importance to warrant calling in for advice the Royal College of Physicians of London. The report of a Committee, afterwards adopted by the College, was to the effect that there existed a wide-spread objection to the use of the term diarrhœa as a cause of death, and then concluded, "it is therefore desirable, if possible, to substitute for it some name equally accurate but conveying to the public the idea of a more serious affection; but we regard it as essential that the idea of specificity intended to be conveyed by the term 'epidemic' should be retained."

They, therefore, advised the use of the term "epidemic enteritis" or "zymotic enteritis," and that synonyms, as "gastro-enteritis," "muco-enteritis," and "gastric catarrh," be discarded. It is to be hoped that medical practitioners will carry out these suggestions in certifying the cause of death.

Influence of Age and Sex.

I have classified the deaths from diarrhœa since I have been Medical Officer of Health according to age and sex in the three following tables:—

Deaths from Diarrhœa in the years 1891 to 1897 inclusive.

Age-Group.	Under 1 year.	Over 1 and under 2 years.	Over 2 and under 3 years.	Over 3 and under 4 years.	Over 4 and under 5 years.	Over 5 and under 15 years.	Over 15 and under 25 years.	Over 25 and under 65 years.	Over 65 years.	Totals.
Males ..	126 (15)	12 (1)	1	—	1	2	—	6	6	154 (16)
Females	83 (8)	12	4	1	1	3	1	9	7	121 (8)
Persons	209 (23)	24 (1)	5	1	2	5	1	15	13	275 (24)

Deaths from Diarrhœa in 1898 (101).

Age-Group.	Under 1 year.	Over 1 and under 2 years,	Over 2 and under 3 years.	Over 3 and under 4 years.	Over 4 and under 5 years.	Over 5 and under 15 years.	Over 15 and under 25 years.	Over 25 and under 65 years.	Over 65 years.	Total.
Males ..	49 (5)	3	—	—	—	—	—	—	2	54 (5)
Females	35 (4)	5	1	—	—	—	—	4	2	47 (4)
Persons	84 (9)	8	1	—	—	—	—	4	4	101 (9)

Deaths from Diarrhœa in 1899 (81).

Age-Group.	Under 1 year.	Over 1 and under 2 years.	Over 2 and under 3 years.	Over 3 and under 4 years.	Over 4 and under 5 years.	Over 5 and under 15 years.	Over 15 and under 25 years.	Over 25 and under 65 years.	Over 65 years.	Total.
Males ..	32 (2)	4	—	2	—	—	—	1	1	40 (2)
Females	34 (4)	3	—		—	—	—	1	2	41 (4)
Persons	66 (6)	7	—	3	-	—	—	2	3	81 (6)

In these tables the figures included in the brackets are the number of children who were known to be illegitimate.

These clearly shew the large proportion of deaths under one year of age, i.e., of the 275 deaths from 1891 to 1897, 76 per cent. were below that limit.

In 1898 the proportion of such was 83·1 per cent., and in 1899 it was 81·4 per cent.

Whilst the deaths of children under five years of age, the percentage of the total deaths was 87·6 per cent. in 1891—97, 92 per cent. in 1898, and 93·8 per cent in 1899.

Sex.

During the years 1891 to 1899, inclusive, the births in the Borough of Blackpool have consisted of 4,097 males, and 3,931 females. From the above tables it will be seen that there have been 207 male and 152 female children who have died from diarrhœa before attaining an age of twelve months. That is, of 1,000 male births, 50·5 have died in that period, of diarrhœa, and only 38·7 out of 1,000 female births. This coincides with the general impression as regards the difficulty of rearing male children.

Effect of Illegitimacy.

Taking the same period of years there were 7,599 legitimate, and 429 illegitimate births. Of the 358 deaths under twelve months of age 321 were legitimate and 38 illegitimate, *i.e.*, 42·2 per 1,000 legitimate births, and 88·5 per 1,000 illegitimate births died from diarrhœa in the first year of life—a death-rate more than double. Illegitimate children are not so well cared for as legitimate ones, and the above fact proves that carelessness is one of the causes conducing to diarrhœa—a cause which will be likewise operative amongst the legitimate children of careless and negligent mothers.

Effect of Season.

This is especially marked, the disease being prevalent to a greater or less extent during the latter half of the third quarter and the first few weeks of the fourth quarter.

During the years 1883—1897 inclusive, the deaths from diarrhœa in the first quarter were 15, in the second quarter 20, in the third quarter 300, and in the fourth quarter 76. The births during the same period and in the corresponding quarters were 1,252, 1,308, 1,466, and 1,424.

This gives a diarrhœal death-rate per 1,000 births of 6·76 for the first quarter, 8·51 for the second quarter, 116·96 for the third quarter, and 30·59 for the fourth quarter.

In comparing these with Dr. Newsholme's figures for the 31 Great Towns, I find in the first quarter that Blackpool comes

between Bristol and Bradford, which are respectively 17th and 18th on the list; in the second quarter between Wolverhampton and Cardiff, the 14th and 15th on the list; whilst in the third quarter it is between Sheffield and Hull, the 28th and 29th on the list. For the fourth quarter the position is between Dublin and Bolton, the 28th and 29th on the list.

The rates for the third quarter of the separate years vary greatly, thus from 30·6 in 1888, 49·1 in 1883, and 58·4 in 1885 to 171 in 1884, 209 in 1895, and 234 in 1893.

Quarterly Diarrhœa Death-rates per 1,000 Births.

Years.	1st Quarter.			2nd Quarter.		
	Births	Deaths	Death-rate	Births	Deaths	Death-rate
1883 to 1897 inclusive	2219	15	6·76	2349	20	8·51
1898	303	1	3·3	336	4	11·9
1899	311	2	6·43	334	2	6
Years.	3rd Quarter			4th Quarter.		
	Births	Deaths	Death-rate	Births	Deaths	Death-rate
1883 to 1897 inclusive	2565	300	116·96	2484	76	30·59
1898	336	70	208·3	285	26	91·2
1899	358	55	153·6	315	22	69·8

Both in 1898 and 1899 the death-rate was below the average in the first quarter, whilst in all other cases except the second quarter of 1899 it was much above the average rate.

To trace any connection between the temperature of the air and the diarrhœal death-rate, I have constructed the following table, giving the diarrhœal death-rates of the third quarters of the years 1891—99, their variation from the average of those years, the mean temperature of the air of the third quarter of those years (the mean temperature being taken to be the mean of the maximum and minimum temperatures), and the variation from the average of those means. I regret that I cannot go further back than 1891, but the meteorological observations before that date are not readily available :—

THE DIARRHŒAL DEATH-RATE FOR THE THIRD QUARTERS OF 1891-99 (INCLUSIVE), AND THE MEAN TEMPERATURE OF THE AIR.

THIRD QUARTER OF ·	Diarrhœal Death-rate per 1,000 births.	Difference from average for these years.	Mean temp. of air for the quarter.	Difference from average of mean temp.
1891 ..	106·6	— 38·5	59·9	+ 0·8
1892 ..	59·1	— 86·0	57·3	— 1·8
1893 ..	234·2	+ 89·1	60·6	+ 1·5
1894 ..	71·8	— 73·3	57·6	— 1·5
1895 ..	209·0	+ 63·9	60·2	+ 1·1
1896 ..	103·3	— 41·8	58·2	— 0·9
1897 ..	160·0	+ 14·9	59·0	— 0·1
1898 ..	208·3	+ 63·2	59·6	+ 0·5
1899 ..	153 6	+ 8·5	59·8	+ 0.7
Averages	145·1	0·00	59·1	0·00

In the above the + sign means that it is in excess of the average, and — sign that it is below that figure.

With the exception of the year 1891, where I have some doubts as to the average for July being given too high, and in 1897 where the differences are only slight, the diarrhœal rate and the temperature of the air are seen to vary in the same direction, and almost, roughly speaking, *pari passu*.

But this investigation can be extended with profit into more detail, and especially if the temperature of the soil at a depth of four feet be taken into account. Since June, 1894, this temperature has been taken, and therefore we can observe the relative behaviour of the earth-temperature and deaths from diarrhœa for the past six years. A chart has been inserted in each successive Annual Report since that year exhibiting this relation.

In 1894 the earth thermometer reached 56deg. F. in the 27th week of the year, and the deaths from diarrhœa commenced in the 29th week, when there were three. The temperature remained above 56deg. F., or very nearly so, until the 37th week, and the deaths practically ceased after the 40th week. Taking the mean of the maximum and the minimum thermometers as the average temperature of the air, the mean weekly temperature never reached 63deg. F.

In 1895 the earth thermometer reached 56deg. F. in the 27th week, and remained above until the 40th week. The first death from diarrhœa was in the 30th week, followed by 2 in the 32nd, and deaths gradually increased until there were 11 in the 36th week. The epidemic ceased with the 44th week.

The mean weekly temperature reached 63deg. F. in the 39th week.

The earth-temperature at four feet in 1896 reached 56deg. F. in the 25th week, and remained in the neighbourhood thereof until the 39th week. The first death from diarrhœa occurred in the 28th week, and the greatest number of deaths (6) in the 31st week. The mean weekly temperature of the air was the highest in the 25th week, being nearly 63deg. F.

It was in the 27th week of 1897 that the earth temperature at a depth of four feet reached 56deg. F., remaining in that neighbourhood until the 36th week. Three deaths occurred in that week, but the five deaths from diarrhœa do not seem to have commenced until the 29th week. The mean temperature of the air was at or above 63deg. F. from the 28th to the 32nd week.

The worst of these years for diarrhœa was 1898, when the earth temperature became 56deg. F. in the 26th week, with one death from diarrhœa. It went up to above 59deg. F. and remained over 56deg. F. until the 40th week. The first week when diarrhœa seemed to be epidemic was the 32nd, with 8 deaths, and remained so until the 44th week. There were 14 deaths in the 38th week.

The mean temperature of the air was above 63deg. F. in the 33rd and 36th weeks only.

In 1899 the earth thermometer reached 56deg. F. in the 25th week, and remained above until the 39th week.

In each of my Annual Reports since 1893 I have published a chart showing the connection between the earth temperature, and the temperature of the air, and the deaths from diarrhœa, but which I do not propose, on the ground of expense, to re-publish here. A perusal of these charts shews clearly that deaths from diarrhœa begin to occur from two to four weeks after the temperature of the earth at four feet reaches 56deg. F. The accompanying chart gives the averages of these data for the six years—1894 to 1899—beginning with the 20th week.

During the years 1898 and 1899 the deaths from diarrhœa have been carefully inquired into, and in those cases where definite information could be obtained as to the commencement of the illness, the cases have been inserted on the accompaning charts for the week during which they started to be ill. These two shew very plainly the onset of the disease one or two weeks after the earth temperature reaches 56deg. F.

I have laboured this point as I consider the earth thermometer gives most valuable information, and I would rather trust it than the indication of the air thermometer. In Blackpool at all events Dr. Ogle's rule that the diarrhœal death-rate becomes high when the mean weekly temperature reaches to about 63deg. F. is not so accurate as the one which tells us to be on our guard when the earth thermometer rises to 56deg. F. I shall return to this subject in suggestions for the future.

Rainfall.

Generally a deficient rainfall associated with a high temperature conduces to a high diarrhœal mortality, but the converse is not always true, that is at times a heavy rainfall is associated with a high diarrhœal death-rate. I have tried to work out this subject on the possible lines that a heavy rainfall would raise the level of the ground water and therefore force out of the ground a quantity of polluted ground air. I cannot however, as yet, trace any connection between rainfall and diarrhœal mortality.. It is noteworthy in 1898 that a heavy rainfall in the 31st week was followed by a number of deaths in the 32nd week, whilst a number of the cases took their rise in the 31st week. This subject is worthy of further attention.

Winds.

On the view that infected atmospheric dust might be carried on to food and especially milk, I have tried to trace a connection between the velocity of the wind, dry weather, and cases of diarrhœa, but without any result.

During the last two years I have had inquiries made into every death from diarrhœa on forms of which the accompanying one is a copy—the object being to discover if there was any overcrowding, any improper feeding, any accumulation of refuse, and the sanitary state of the premises generally.

Name .....
Address .....
Age .....
Occupation of Father .....

Occupation of Mother.....
Age of Father .....
Age of Mother .....
Legitimate or Illegitimate .....
No. of children Mother has had .....
Habits of Mother, temperate, intemperate, clean, tidy, untidy, dirty....
How has patient been fed, if child, whether on breast, bottle, breast and bottle, Infant's Food .....
If Soothing Syrups have been used .....
If Insured .....
If in a Burial Club .....
Milk Supply .....
Date of Death .....
Cause of Death..... .....
By whom certified .....
Date of commencement of illness and any account of the illness and its presumed cause you can find .....
State of house, clean, dirty, No. of Rooms.....
No. of Occupants at date of death .....
State of Back Street and Passage .....
State of Front Street in this neighbourhood.....
State of yard, how paved .....
Any accumulation of manure or other filth in the neighbourhood of the house .....
State of drains when last tested and date of test .....
Where is milk and other food stored, and describe the place as to its floor, ventilation, lighting, and promixity to drains.....
Any cesspool, pail closet, ashpit, ashtub in connection with the house, and describe nature of it in each case.....

From these inquiries I have made the following Tables, some of the subjects, *e.g.*, as to whether mother is temperate or intemperate I have not pursued further as the information did not appear to me to be definite enough.

Children previously borne by Mother.

By combining the returns for 1898 and 1899 I find that I have particulars as to the number of children in the family, and the number dead and alive in 134 cases, which can be classified thus:—

Deceased was:	No. of Cases	Mother had living Children:										
		none	one	two	three	four	five	six	seven	eight	nine	ten
First child	42	42	..	..	..	..	..	..	..	..	..	..
Second ,, ...	25	5	20	..	..	..	..	..	..	..	..	..
Third ,, ...	19	1	7	11	..	..	..	..	..	..	..	..
Fourth ,, ...	10	..	5	4	1	..	..	..	..	..	..	..
Fifth ,, ...	8	..	..	3	2	3	..	..	..	..	..	..
Sixth ,, ...	11	..	1	1	3	4	2	..	..	..	..	..
Seventh ,, ...	3	1	..	..	..	1	1	..	..	..	..	..
Eighth ,, ...	2	..	..	..	1	..	..	1	..	..	..	..
Ninth ,, ...	1	..	..	..	..	..	..	1	..	..	..	..
Tenth ,, ...	4	..	..	..	..	1	..	..	1	1	1	..
Eleventh child ..	3	..	..	..	..	..	2	..	..	1	..	..
Twelfth ,, ..	2	..	..	..	..	1	..	..	..	..	..	1
Thirteenth ,, ..	2	..	..	..	2	..	..	..	..	..	..	..
Seventeenth ,, ..	1	..	..	..	..	..	1	..	..	..	..	..
Eighteenth ,, ..	1	..	..	1	..	..	..	..	..	..	..	..
Totals	134	49	33	20	9	10	6	2	1	2	1	1

In one instance a mother lost her second child in 1898 (the first child being already dead), and the third child in 1899.

Feeding.

In 1898, of the 84 children who died from diarrhœa under twelve months old, I have particulars of the feeding in 75 cases.

1898.

Character of Feeding:	Under three months old.	Over 3 months and under 6 months old.	Over 6 months and under 12 months old.
Breast.....	1	3	1
Breast and Bottle	2	9	4
Bottle only	17	18	20
Totals	20	30	25
Infants' Food as well ..	2	8	11

The particulars of the feeding in 66 deaths from diarrhœa under twelve months old in 1899 are as follows:—

1899.

Character of Feeding:	Under three months old.	Over 3 months and under 6 months old.	Over 6 months and under 12 months old.
Breast	1	1	..
Breast and Bottle	4	8	5
Bottle only	9	13	25
Totals	14	22	30
Infants' Food as well ..	4	6	11

Combining the two years it is found that of 34 deaths under three months old, only two had had the breast alone, whilst 26 had been fed on the bottle. I have no statistics as to the proportion of babies fed on the breast and bottle respectively, but the above figures make it quite clear that artificial feeding is one of the most potent cases of infantile diarrhœa. If possible a child should be fed

wholly on breast milk until it is at least six months old, and it is seen that of 86 children who died under six months, only 6 were stated to have had the breast alone; but of these latter I suspect that it is very probable that if we had been able to make strict inquiry we should have found that they had had some small quantity of cow's milk or artificial food shortly before the disease occurred.

Soothing Syrups.

Of the 134 deaths the mothers acknowledged to having used various kinds of infant's soothing syrups in 16 cases only.

Insurance.

Of the children under one year old in 1898 and 1899, the particulars as to insurance are :—

	1898.	1899.
Not insured	37	26
Insured for £6	—	1
,, £3	3	1
,, £2 10s.	1	5
,, £2	3	5
,, £1 10s.	11	8
,, £1	—	1
,, 15s	—	1
,, 12s. 6d.	2	1
,, 10s.	—	1
Insured and in half benefit £1 10s.	1	—
Insured and not in benefit	12	12
Insured (amount not stated)	1	2
	71	64

Overcrowding.

The evidence on this point is not very valuable, firstly, because in many cases the inquiries could not be made shortly after the death, and secondly, because there is a natural tendency to keep the sanitary officials in ignorance on this subject. However, I find that of 162 houses in 13 there was overcrowding, if we accept more than two persons to each room of the house as overcrowding. This is only a crude standard, but it was impossible with the staff at my disposal to have the rooms measured.

State of Streets Adjoining Houses where Deaths from Diarrhœa Occurred.

The 101 deaths from Diarrhœa in 1898, occurred in 100 houses, and the 81 deaths in 1899 in the same number of houses. The particulars with regard to 167 of these 181 houses are :—

Front Street in good repair	110
Front Street in bad repair	12
Front Street not formed	44
No Return	1
	167

Back Street formed, and in good repair	54
Back Street formed, but in bad repair	7
Back Street not formed	99
No back Street	2
No Returns	5
	167

It is very significant that out of 167 houses where deaths from Diarrhœa occurred the large proportion of 99 of them had not yet had the back street formed, whilst in 44 of these the front street was not formed as well. This seems to be almost conclusive proof of the danger to the health, and especially to that of young children of living in houses without properly paved and cleansed streets.

I have not been able to go into further detail as to the effect of the nature of the pavement of the street on the health of the individual.

Premises.

The houses have been carefully inspected, the drains examined, and tested with the smoke test. The result of this inspection I have tabulated as follows :

	1898	1899.
Houses with drains having cement joints (which were satisfactory to the smoke test)	32	27
Houses with drains having cement joints (which showed a leak somewhere with the smoke test)	9	17
Houses having drains with puddle joints (which withstood the smoke test)	10	5
Houses having drains with puddle joints (which proved to be leaky)	48	32
Houses with no drains	1	0
	100	81

	1898.		1899.
Houses with drains disconnected by intercepting trap	78	....	67
Houses with drains not disconnected by intercepting trap	17	....	14
Houses with drains disconnected from sewer, but not adjoining houses	4	....	0
Houses with no drains	1	....	0
	100	....	81

Houses with house w.c. and yard w.c. both satisfactory	7	....	15
Houses with house w.c. leaky and yard w.c. satisfactory	2	....	1
Houses with house w.c. satisfactory and yard w.c. leaky	5	....	7
Houses with house w.c. and yard w.c. both leaky	2	....	1
Houses with yard w.c. only, which was satisfactory.	39	....	29
Houses with yard w.c. only, which was leaky	36	....	23
Houses with galvanised iron pails, for pail closets	7	....	4
Houses with privies	2	....	1
	100		81

Houses having drains ventilated with two or more untrapped openings	30	....	29
Houses having drains ventilated with only one untrapped opening	55	....	42
Houses having drains unventilated	14	....	10
House with no drains	1	....	0
	100	....	81

Houses with cellar drains satisfactory	2	....	1
Houses with cellar drains leaky and not disconnected by intercepting trap	0	....	1
Houses with cellar drains having leaky puddle joints disconnected by intercepting trap	2	....	2
Houses with cellar drains having leaky puddle joints, not disconnected by intercepting trap	3	....	2
Without cellars	93	....	73
	100	....	81

Houses with the ordinary open ashtub	60	....	52
,, ,, ,, ashtub covered	4	....	1
,, ,, open ashpit	3	....	5
,, ,, approved modified ash receptacle	2	....	2
,, ,, covered ashpit	9	....	3
,, ,, galvanised iron pail	0	....	2
,, ,, improper receptacle, mostly apple barrels or deal boxes	19	....	12
,, without ash receptacle	3	....	4
	100		81

YARDS.

	1898.		1899.
Houses having yards flagged	68	....	59
,, ,, ,, and in bad condition	4	....	0
,, ,, concreted	4	....	2
,, ,, bricked	4	....	7
,, ,, bricked and in bad condition	6	....	2
,, ,, bricked and flagged	7	....	1
,, ,, asphalted in bad condition	1	....	3
,, ,, covered with cobbles and asphalte	1	....	0
,, ,, paved with cobbles	4	....	3
,, ,, paved with cobbles and flags	0	....	2
Houses without yards	1	....	2
	100	....	81

Houses with ground or basement floor concreted	3	....	0
,, ,, ,, ,, flagged	25	....	11
,, ground floor tiled	3	....	0
,, ground floor formed of wood, wholly or partially	69	....	70
	100	....	81

From the above it will be observed that of the 181 houses 106 had leaky drains, and that a larger proportion of these houses were without intercepting traps than I believe is the case in the town generally.

Further, 97 of these houses had not the drains ventilated, but were provided with only one untrapped opening, at a low level from which the stagnant foul gas in the drain is dislodged near to the noses of bystanders every time water is poured into the drain. This is what passes for the ventilation of drains with the Building Plans Committee in a certain class of property.

The condition of the paving of back yards does not bring out any striking feature.

The large proportion of houses having the ground floor formed of wood, wholly or in part, will, I expect, be about the same as exists in all the houses of the Borough—the bye-law as to concreting, asphalting, &c. the site not being enforced.

Distribution of the Disease.

The number of deaths from diarrhœa in each ward for the years 1898 and 1899, and for the years 1891 and 1897 inclusive are given in the subjoined table :—

Ward.	Claremont.	Talbot.	Bank Hey.	Brunswick.	Foxhall.	Waterloo.	Totals.
1891—1897..	31	89	10	30	84	31	275
1898.....	16	28	1	14	25	17	101
1899.....	6	28	1	10	25	11	81

For the year 1898 the diarrhœal death-rate in the several wards arranged in order from the highest to the lowest are, Waterloo 2·7 per 1,000 inhabitants, Talbot 2·6, Claremont and Brunswick 2·1, Foxhall 2·0, and Bank Hey 0·4.

For 1899 the rates and order are Talbot 2·5 per 1,000 inhabitants, Foxhall 1·8, Waterloo 1·6, Brunswick 1·4, Claremont 0·7, and Bank Hey 0.4.

The order of proportionate deaths from diarrhœa for the years 1891 to 1897 are Talbot, Foxhall, Bank Hey, Waterloo, Brunswick, and Claremont.

A better test of this will be to take each ward and calculate the number of deaths under twelve months from diarrhœa per 1,000 births for the years 1891—1897 (inclusive), 1898, and 1899.

Death-rates of Children under Twelve Months Old, from Diarrhœa per 1,000 Registered Births in each Ward.

Ward.	Claremont.	Talbot.	Bank Hey.	Brunswick.	Foxhall.	Waterloo.	Totals.
1891—1897..	32·1	42·3	15·4	30·3	46·4	38·6	38·7
1898.....	80·9	64·7	27·0	67·5	55·5	97·7	66·9
1899.....	15·8	66·4	41·7	51·7	52·3	50·0	50·2

Claremont Ward.

Nine of the twenty-two deaths in 1898 and 1899 died in Springfield, where enteric fever was also noticed to occur. The others mostly occurred in Exchange Street and High Street.

Talbot Ward.

The area bounded by Larkhill Street, George Street, and an imaginary prolongation of it into Moister Road and New Road is responsible for the heavy mortality in this ward. Thus in 1898 thirteen out of the twenty-eight deaths occurred within it, whilst in 1899 there were ten deaths out of the same number. The district known as Queenstown had four deaths in 1898 and two in 1899. There were two deaths in Greenhill in 1898 and none in 1899. In 1899 there were three deaths in some new houses in Little Layton, but the sewerage of this district is still incomplete. To a great extent the deaths from diarrhœa are similarly distributed in this ward to the cases of enteric fever.

Bank Hey Ward.

Alfred Street and Coronation Street are the addresses where the two deaths occurred in this ward.

Brunswick Ward.

In 1898 five deaths occurred in the neighbourhood of Railway Street, whilst there were three in 1899. This has been mentioned as a typhoid fever area also. In 1898 there were four deaths in the neighbourhood of Coop Street and Caroline Street, whilst in 1899 there were three deaths in the vicinity of Oddfellows Street.

Foxhall Ward.

The distribution of diarrhœa in this ward follows with some degree of closeness that of enteric fever. Thus in the district bounded by Central Drive, Ribble Road, Woolman Road, and Keswick Road, there occurred eighteen of the twenty-five deaths in 1898, whilst in 1899 there were eight deaths in the same district, with four more in the district immediately south of Central Drive and facing this.

Waterloo Ward.

The reason of the high rate in this ward for 1898 was because of six deaths in the Benson's Lane district, three deaths in Brook Street and Crossland Road, and three in Stamford Street, thus accounting for 12 out of the 17 deaths. In 1899 there were four deaths in the Benson's Lane district, one in Stamford Street and four in Vicarage Lane and Flag Causeway, making nine out of eleven deaths in this year. The distribution here does not follow closely that of the cases of enteric fever, but in this ward some districts where enteric fever is the most marked are peopled with a population of such a character that their infants will have a great amount of intelligent care bestowed upon them.

III.—DESCRIPTION OF FEATURES OF THE BOROUGH COMMON TO THE TWO DISEASES.

Geology.

The town may be roughly divided into two portions, the first being that north of the Central Station, and having a subsoil of boulder clay varying from 30 to 40 feet in thickness, and resting on an "ancient plane of marine denudation." The second, which lies south of the Central Station, consists of peat lying on the same plane. This bed of peat is of varying thickness, of 10, 20, or even 30 feet, being overlain with a greater or less thickness of blown sand.

The boulder clay subsoil extends beneath Claremont, Talbot, Bank Hey, and a portion of Brunswick Ward, and also the easterly portion of Foxhall Ward. The portion of Brunswick Ward from the Central Station to Princess Street, and to a short distance east of the coast railway line, has a peaty sub-soil, which in this region comes nearly to the surface, and is of a variable depth, rendering the ground very treacherous in places. The remainder of Foxhall and Waterloo Wards has a good depth of blown sand overlying the peat, except in isolated places. In parts of this portion of the Borough the sand is what is known locally as "ream sand," *i.e*, very fine, and in the ground it has the consistency of mortar.

The northern portion of the Borough is the highest—the highest portion being 97 feet above Ordnance datum at the top of Warbrick Hill. There is higher ground to the east of the northern portion of the Borough, and the surface slopes irregularly towards the sea and towards the south up to about the lowest point, at the Manchester Hotel, where the main sewer outfall is situated. South of this the surface is very flat, and averages about 20 feet above Ordnance datum, being in many places only 16 feet above it.

Sewerage.

The district is drained as follows :—

(i) By the chief system of sewers which drains by gravitation the Borough except those portions mentioned below. This empties into a large sewer chamber, under Rigby Road and Tyldesley Road, which is egg-shaped, being thirteen feet in vertical diameter, and nine feet across at its widest part. The Lytham Road sewer, which is a pipe one, enters this chamber from the south, and the Bonny Street culvert, which is a new one, from the north, as well as the old culvert beneath the Promenade, whilst the inland main sewer empties into it from the east.

(ii) A small sewerage system which carries the sewage from Little Layton by gravitation into a tank situated in a field east of the cemetery, whence it is pumped daily into the terminus of the inland main sewer in Layton Lane, down which it flows by gravitation.

(iii) The drainage from the district east of the portion of Lytham Road south of the South Shore Station, and east of the railway line south of the destructor, extending inland to Middle Lane and Central Drive, flows by gravitation to a tank at the destructor, whence it is pumped into a new sewer chamber under the extension of Rigby Road, connected to the old one, whence sewage can flow by gravitation to the sea, or when completed it can be driven through a pipe sixteen inches in diameter into the sea against the force of the tide.

(iv) The district east of Middle Lane and south of Cowgap Lane is drained by gravitation to a pumping station at the corner of Cowgap Lane and Bloomfield Road, whence it is pumped into the tank at the destructor mentioned under (iii).

The sewage collected by all these systems discharges into the sea. Formerly it was carried out to nearly low-water mark at extreme spring tides, by a three-foot iron pipe. This, some years since became blocked and broken, and allowed most of the sewage to escape midway between the outlet and the shore, so that the fereshore became much polluted with sewage, and gave rise to the infection of the mussels on the Piers in 1896.

A new iron outfall of three feet diameter is being laid as rapidly as possible, and is now nearly completed, whilst the old outfall is still being used to carry the sewage out to sea. The arrangement of the old outfall was very faulty, for the valves which were intended to keep out sea-water from the sewer chambers when the tide was up did not act, consequently the chambers which had been designed to store the sewage of the town whilst the outfall was tide-locked were filled with sea-water, the sewage being backed up in the main sewers or finding its way by two openings in the sewer chamber into the culvert of Spendyke, and being carried up this stream by the tide flowing up-stream in its bed. Spen-dyke is one of the principal watercourses of the district, which originally emptied into the sea at the Manchester Hotel, and was until recently carried for several hundred yards through a culvert alongside the sewer chamber and emptied at the foot of the hulking. In the last few years this culvert has been extended several hundred yards further inwards.

The new sewer outfall is to be carried out to sea 800 yards from the foot of the hulking, so as to deliver its sewage below extreme low-water mark. The old outfall is being repaired and extended to the same distance, and is to be used as a storm overflow for the main outfall. By valves fixed in a penstock chamber beneath the promenade it is intended to keep all sea-water

from the sewer-chambers and sewers, whilst the outfall is tide-locked. This sewerage system should be absolutely shut off from Spen-dyke and its outfall, or sewage will be forced inland by the incoming tide.

It remains now to be seen whether this method of sewage disposal will be satisfactory.

(v) A smaller system which takes the sewage from a portion of Claremont Park, and from a new estate in Claremont ward which contains Cheltenham, Chesterfield, Clifford, Carshalton, Ashburton, and Handsworth Roads, &c. This sewage flows by gravitation to an outfall at the Gynn, near the extreme north of the Borough, which has been lately enlarged and extended further sea-wards, viz., to a distance of 440 yards.

Collection of Excreta and Household Refuse.

The town is practically a water-closet town, there being now only 62 privies in the Borough, which contains 10,203 houses. These privies are in the rural portions of the Borough. There are still 132 houses with pail-closets, but these with the completion of several new sewerage schemes are being supplied with water-closets.

The system of collection of household refuse which prevails in the town is to collect it in open wooden ash-tubs, which are usually made by sawing empty petroleum barrels into two and putting an additional hoop around each half, and a pair of handles. This, to my mind, is a most objectionable method of collection, although it is a great improvement on the deep, open ashpits which formerly were used. My objections are that, being open they allow the dust to be carried into the atmosphere and adjoining premises by the wind and animals, and that rain keeps their contents moist and encourages decomposition. Being absorbed they become offensive, and being of wood they are set on fire by the hot ashes. The contents of these tubs are emptied at least once weekly, but in some portions of the Borough they are emptied two or three times a week. There are still 294 ashpits in the Borough which serve

497 houses, and the contents of these are not removed so frequently. These ashpits are being removed under notice as occasion allows.

What has been recommended for a number of years has been a brick receptacle, with a cover and cemented inside, the floor being of flag or concrete, at least three inches above the surface of the yard, with a door extending to the bottom of the ashpit and its full width, opening on to the back street, and another door into it from the yard. Such receptacles could be easily emptied, washed out, and disinfected, if necessary. There are 366 such receptacles.

The refuse collected is almost entirely dealt with at the destructor, so-called "tips" having been abolished since 1891.

Water Supply.

The public water supply, which is now laid on to nearly every part of the Borough, is an upland surface water derived from the Bleasdale and Grizedale Fells. The gathering ground is a good one, but the water derived from it is soft and of a peaty nature, One filter bed has only been provided for the filtration of this water. so that water is delivered in an unfiltered condition, and at times and in certain parts of the Borough it is of a dark brown colour, and a most uninviting looking beverage. Peaty waters are well known to give rise to diarrhœa, and therefore I cannot acquit the water supply of not having some influence on the prevalence of diarrhœa, although it is difficult to get direct evidence thereof. At all events, if the water were culpable, it would most surely affect most severely the young children, and especially the infants who were being brought up on the bottle, who take a large proportionate amount of water. This is the portion of the community I have previously shewn who are most directly affected by it.

Sewer Ventilation and Flushing.

The system of ventilating the sewers is by an open grating near to the manhole cover at the level of the street, with a few high level shafts up the gable ends of houses in various parts of the Borough. Some of these I found a few years ago to be defective at

the foot and to be responsible for infectious disease in the adjoining dwellings, so that I had them all tested, and those which were found to be leaky were cut off from the sewer. Besides these, there are on the Promenade three iron columns, about 100 feet high, which were originally used as electric light poles, and are now no doubt very useful and safe ventilators.

The street gratings are not universally open, and in many places are purposely closed because of complaints. I look with extreme suspicion upon these gratings at the level of the street. I do not care to enter upon the vexed question of the necessity of ventilating sewers in this Report; but it appears to me that it is far more important to see that the sewers are self-cleansing and to provide adequate flushing arrangements, especially for the smaller sewers in the back streets.

Milk Supply.

The cowsheds in the Borough do not by any means conform to the Regulations with regard to adequate cubic space for the cows, ventilation, lighting, and cleanliness, and with regard to those outside the Borough whence milk is sent into the Borough, the same criticism applies, but more forcibly. Dirty methods of milking prevail in the district, so that it is readily possible for the milk to be contaminated with dirt from the cowsheds, the hands of the milkers, the cows' udders, and even the dung of the cows. A strong effort is now being made to prevent this, but even with this inspection it is necessary to boil all milk.

IV.—CONCLUSIONS AND SUGGESTIONS.

Enteric Fever.

In the years 1898 and 1899 this disease was more prevalent than usual in England and Wales. It has been lately discovered that the cause of infection—the bacillus of typhoid fever, can exist, and in a proportion of the cases does exist, in the body of a person recovered from the disease for a considerable period afterwards, even as long as twelve months. Amongst the large number of

people who visit us some must be in this unsuspected infectious condition, and will therefore infect the sewers and drains. Hence there is always the possibility of any emanations from these infected sewers and drains causing the disease in susceptible persons. The defect in the sewer outfall and the consequent pollution of the foreshore during the last few years must be held responsible for the increased prevalence of the disease in later years, and, indeed, in 1896 I was able to trace the disease to this source. When the present works are completed and a winter season has elapsed, this cause ought to have been eradicated.

The earlier notification of the disease is very desirable, and every means should be adopted to arrive at an early diagnosis in all suspicious cases, especially by the use of the Widal's test. It would be far better to err on the side of caution in this matter, and there can be no disgrace in not always being correct in diagnosing such a difficult disease as enteric fever, a conclusion as to which being founded mostly on the absence of definite symptoms.

It is of paramount importance to every inhabitant of the Borough that we should be kept clear of diseases such as this, and early notification of all suspicious cases with hospital isolation will have a very great influence. As with every other infectious disease it is the mild, the unrecognised, and the unnotified cases that aid so materially in keeping the disease prevalent.

Diarrhœa.

The conclusion I have arrived at as to the cause of the excessive prevalence of this disease in Blackpool is that the period of the year when climatic influences are most pronounced in favouring the spread of the disease, coincides with the busiest part of the season, when the town is crowded, the dwellings also, and the mothers are so busy in assisting to earn a livelihood for the year in a relatively short space of time that they have not the time to devote to their young offspring, which they ought to have. This will also have the effect of inducing many mothers either to wean their children too soon, or else never to attempt to suckle them at all. I have no statistics

available as to the proportion of mothers who do and do not feed their children at the breast, but from the foregoing consideration I strongly suspect that a larger proportion do not suckle their children than in similar populations in other towns.

I am preparing a form of handbill giving directions as to the care of children, which it is intended to distribute throughout the Borough, and to bring it under the notice of the people most concerned by requesting the Registrar of Births and Deaths to hand one to the parents of children when they come to register births. Every encouragement should be given to the girls in the higher standards of our elementary schools to study Hygiene, and especially the portion dealing with the care and management of children. The Corporation might follow the example of several others by offering prizes for proficiency in this subject.

As an experiment it might be advisable to make diarrhœa in children under five years of age a notifiable disease during the months of July, August, and September. This would give the sanitary officials valuable information, and it would remain to be seen whether the instructions that would be given and measures of prevention taken, would have any beneficial result.

Suggestions Which Should Benefit Both Diseases.

(i.) That all sewers should be inspected, and that those which are laid at too slight a gradient, and thus are sewers of "deposit," should be relaid, and if the circumstances of the case, be such, to some central chamber where a pumping station could be placed. For example, the sewers in Springfield require to be laid so as to find an exit into the general sewerage system of the town by Bank Street, and not under the railway as at present. On the other hand, the portion of the Borough south of Station Road and west of the railway line cannot be properly drained by gravitation into the Lytham Road sewer, and for this portion I consider some pumping arrangement is urgently needed.

(ii.) Flushing of the sewers either by automatic arrangement or by manual labour should be regularly carried out. With

a view of preventing diarrhœa, I should recommend the dead ends of the branch sewers in the back streets should be flushed weekly with water from tank carts when the earth thermometer at four feet is approaching 56deg. F., *i.e.*, about the beginning of July.

(iii.) A more careful and perfect method of street cleansing should be adopted. A recent authority has maintained that the dissemination of street dust containing horse dung is to a large extent responsible for the spread of summer diarrhœa. Although this has not been conclusively proved, yet dirty streets with clouds of offensive dust flying about, and especially so at the time when it is being swept up, has a deleterious influence on the public health, and by settling on milk exposed in open vessels in milk shops, on fruit, fish, meat, &c., exposed in shops, soils the food supply, and thus gains admission into the human body. The experience of both Liverpool and Leeds of the greater healthiness of districts after the streets had been carefully flushed than before is very valuable. Many of our streets being made of macadam are very dusty.

In my opinion we ought as far as practicable to adopt the method of washing our streets clean rather than sweeping them clean, and this ought to be more carefully and more frequently carried out on those portions used as cabstands.

We have at our front an enormous volume of water which could be readily used for this purpose, but for some reason or other there appears to be a rooted objection to the use of sea-water for sewer flushing and street watering, not to mention street washing. If we lived 50 miles inland, I suppose, we should be anxious to obtain sea.water for these purposes, and be busied in preparing schemes to carry it out. The water that is now being used for these purposes—Fylde water—will be required solely for domestic purposes, especially in the summer season, when water is most required and a drought is most likely to occur. Until more storage in the form of additional reservoirs is provided, the Fylde Water Board will not be able to allow a large consumption of water in the summer time for flushing sewers and streets.

(iv.) Front streets and back streets should be formed as quickly as possible, and there should not be any delay in putting into action the complicated legal machinery required to get this carried out.

(v.) Back passages which are not flagged or are in a defective condition should be dealt with under the Blackpool Improvement Act, 1893. These, along with back yards, should be kept particularly clean by swilling in the months of July, August, September, and October. The Sanitary Inspectors should give particular attention to this matter at that period of the year.

(vi.) All drains should be adequately ventilated, and the practice of allowing the builders of a certain class of new houses to only place therein one untrapped opening and one ventilating shaft should be at once stopped.

(vii.) The sites of all new houses should be concreted or asphalted according to the Bye-law in that behalf. This would prevent emanations from the ground, the air of which may be polluted by leaky sewers and drains, and from leaky gas-pipes, not to mention decomposing organic matter contained in it.

(viii.) The present objectionable method of storing household refuse in open wooden tubs should be abolished. Properly-built non-absorbent receptacles as explained above might be insisted upon, or else portable galvanised iron pails, with a cover, could be provided; whilst in other cases Quine's sanitary ashbin could be built in the back yard wall.

Any method which would facilitate the collection of the refuse will obviously admit of its more frequent removal.

In conclusion, I trust that this Report will be carefully considered, and anything therein that is thought of value will be adopted at once. I regret that I have not as yet had the opportunity of prosecuting my inquiries in certain directions further.

I am, Gentlemen,

Yours obediently,

ALFRED JASPER ANDERSON.